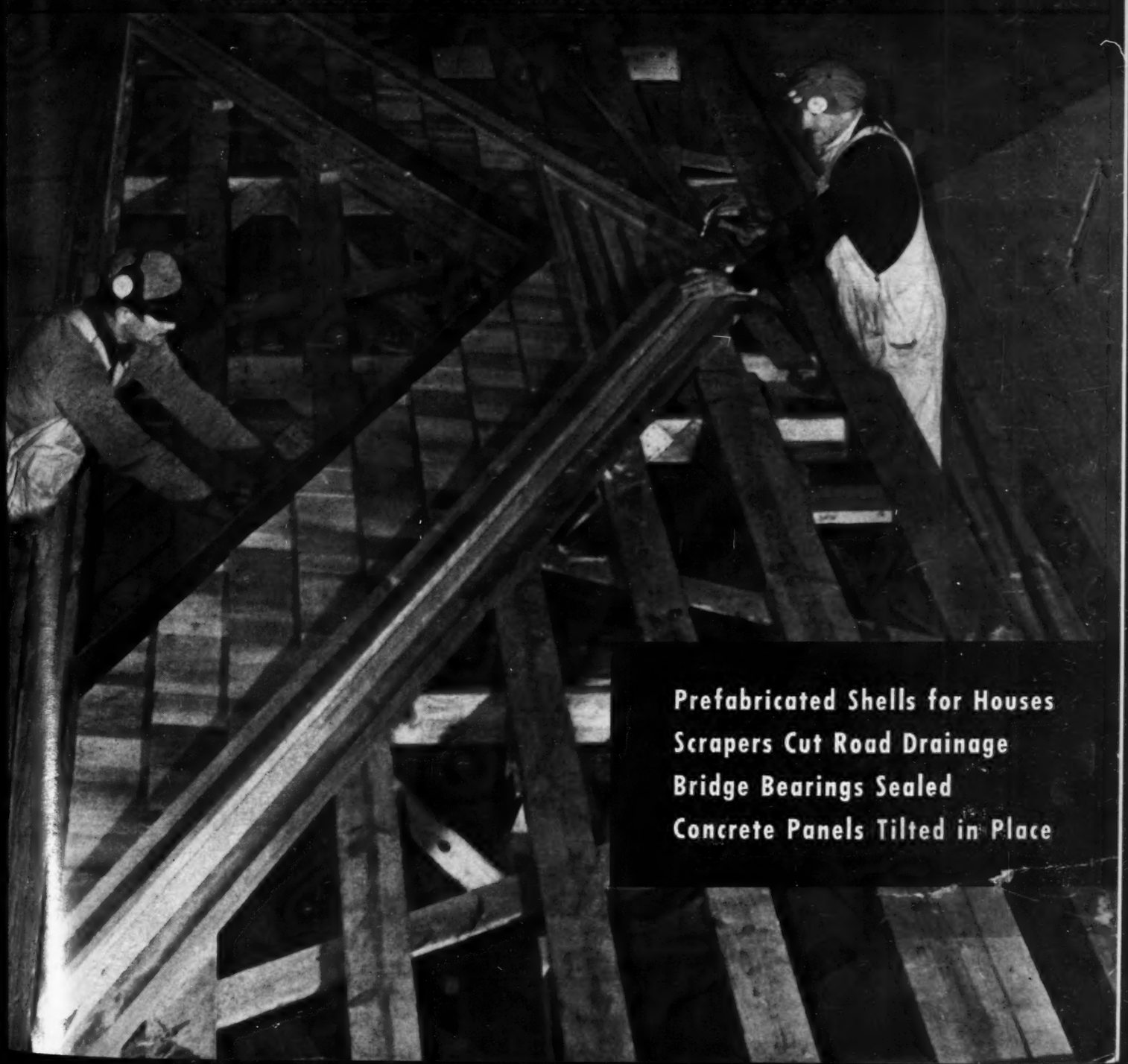
Construction Methods

MARCH 1946

MAR 0 1946
DETROIT

Gables for prefabricated house shells are assembled as panel units on precision jigs.



Prefabricated Shells for Houses
Scrapers Cut Road Drainage
Bridge Bearings Sealed
Concrete Panels Tilted in Place

Use Hi-Bond Bars for fast and secure placement*

Placing of reinforcing steel is done more speedily and securely with HI-BOND bars. The helical ribs dovetail so well at intersections that the simplest wire tie will hold HI-BOND bars firmly fixed even in difficult wall positions. When HI-BOND Concrete Reinforcing Bars are tied in position they easily support a heavy man. The saving in time, labor and wire makes possible more economical construction.

With HI-BOND, deflections in beams are reduced, width of cracks is minimized, and the possibility of steel corrosion is less. When spliced, they will develop their tensile strength in splices with a shorter lap than commonly used. Irrespective of the position in which they are cast HI-BOND bars provide a greater mechanical grip in the concrete and, therefore, offer higher resistance to slippage. All these advantages result in better, stronger, more efficient installations—no premium is assessed for HI-BOND'S improved design—when you specify HI-BOND *you get* extra value at no extra cost.

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Sales Offices: Cincinnati, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul. *Principal Products:* Bars, Structurals, Plates, Sheets, Strip, Tin Plate, Floor Plate, Piling, Reinforcing Bars, Rails, Track Accessories.

*Reg. U. S. Pat. Off.

INLAND HI-BOND

CONCRETE REINFORCING BARS

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Construction Methods

A Pictorial Survey of Current Practice, Equipment and Materials

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MARCH, 1946

Cuts and Fills

Housing takes the spotlight in the construction field and will probably remain there for a year or so. Many feel that if all construction restrictions were removed housing would automatically be taken care of, but under the conditions as now developing other types of work may be curtailed and many contractors will find themselves in the house building business for the first time. Nevertheless it is well to remember that home development requires more than houses—it calls for new streets and roads, new sewerage and water projects, new utilities and transportation facilities and new stores and schools.

* * *

The 1947 Road Show, planned for Navy Pier in Chicago next February, will not only be the greatest exhibition of construction machinery in a long series of successful shows, but also promises to be the greatest trade exhibition ever staged. By that time manufacturers will be in a position to show the new and improved units they have had in mind, but which necessarily have been kept under cover for the last four years.

* * *

In our January issue we presented a preview of the equipment to come. The models shown and described were but a sample of what is in store for the constructor, for many manufacturers were not set on their new developments. No radical changes are expected in the equipment line, but improvements and betterments will make for more efficient, faster and cheaper construction. New and better machines promise to keep the cost of construction down.

* * *

Last month in a tribute to Warren S. Bellows, we moved the towering San Jacinto monument from its original resting place at Houston, Tex. to San Antonio. This great construction feat was done without fanfare, with no equipment priorities or permits and not very much labor. To resentful Houstonians, we hasten to say we're moving San Jacinto right back again to where it belongs. Houston, here's your monument, and may it never again be disturbed by a lapse of an editor's memory.

THE *How* OF IT

For the benefit of readers concerned with the practical application of method or equipment the following references are to articles or illustrations in this issue that tell:

How **HEAVY-DUTY DREDGE BUCKETS** cleared pool below Coulee Dam of rocks and boulders —p. 79

How **FRAME HOUSES** were fabricated in panels —p. 82

How **BRIDGE BEARINGS** were sealed to stop pier concrete spalling due to leaking and freezing —p. 86

How **STEEL OIL DRUMS** were converted by Seabees to variety of uses —p. 90

How **ALUMINUM POWDER** was used in mixing concrete to cut building costs —p. 94

How **TRACTOR SCRAPERS** speeded completion of highway and drainage ditch —p. 96

How **SCARIFIED BITUMINOUS MAT** was salvaged for re-use in graveling regraded highway —p. 97

How **TRACTOR** was modified for earth hauling —p. 98

How **WORN-OUT GAS MAIN** was relined —p. 98

How **CONCRETE HOUSES** were built with big, movable forms —p. 100

How **AIRPORT** is drained by precast U-box sections —p. 101

How **WELLPOINTS** dried up excavation for bridge pier —p. 102

How **JEEP** is used in peacetime construction work —p. 104

How **BAILEY BRIDGE** collapsed and was replaced by Army Engineers —p. 107

How **TILT-UP METHOD** was used in erection of precast concrete wall panels for one-story buildings —p.108

How **MINE DETECTOR** was used to locate shrapnel in lumber before sawing —p. 114

How **VENT HOLES** were drilled in cramped working space in Grand Coulee Dam powerhouse —p. 114

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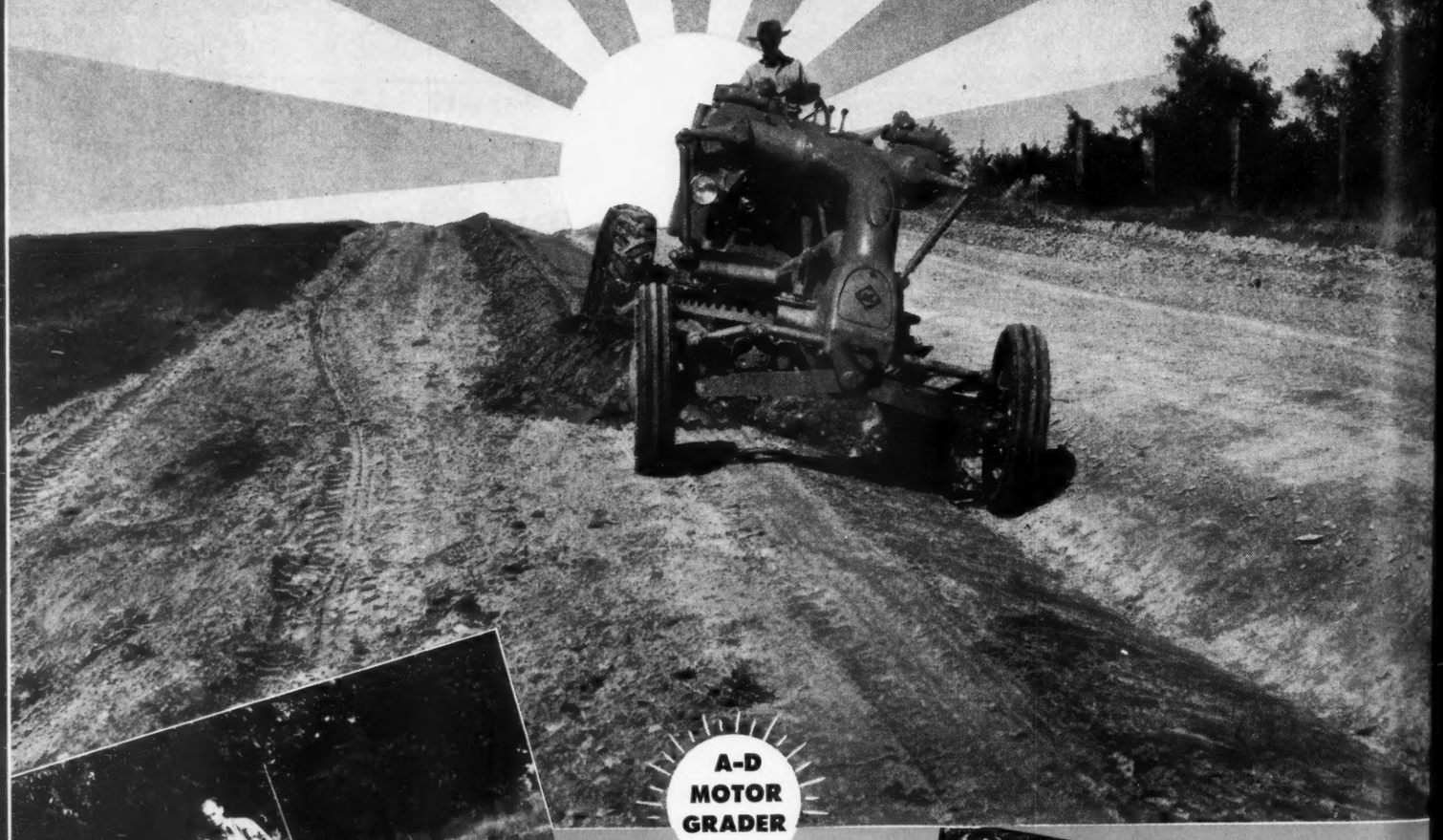

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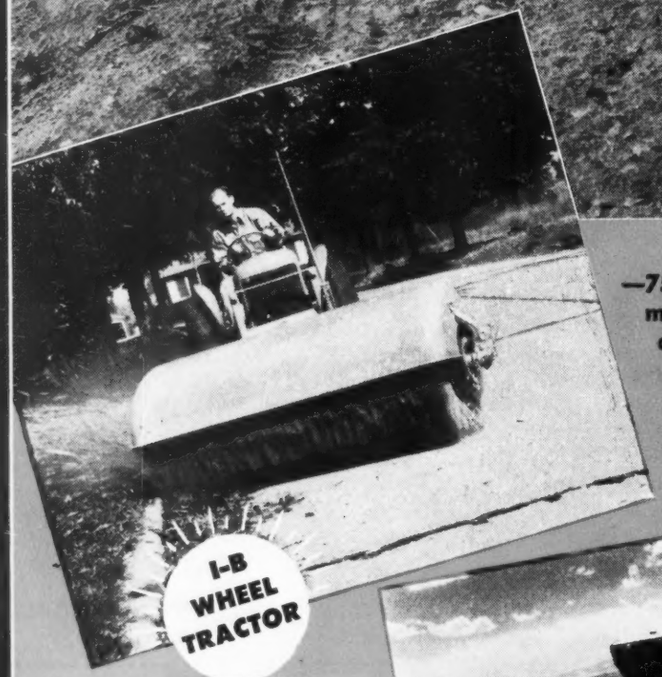

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THE JOB JESTER

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"I told the dummy not to take too big bites with that new atomic power shovel."

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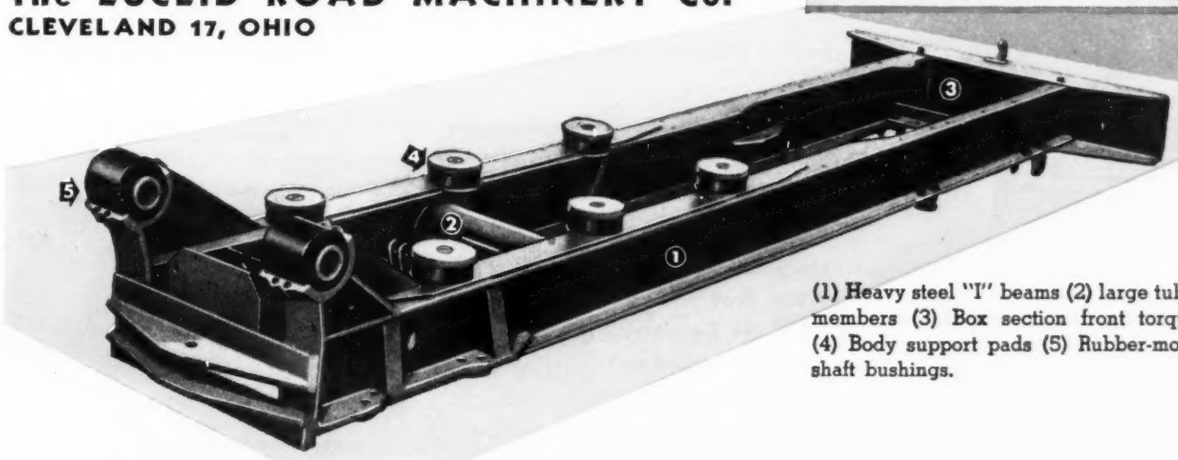
The strong, rigid frame is the backbone of the Rear-Dump Euclid, the hauling unit that has proved its dependable, low cost performance on hundreds of the toughest jobs. Constructed of wide-flanged, deep sectioned "I" beams stiffened by large tubular and box section torque members, the Euclid frame is built to last for the life of the truck. The body is cushioned on large rubber support pads which absorb the heavy impacts of loading and hauling over rough roads . . . there is no metal to metal contact between the body and frame.

Ask your Distributor to show you how all Euclid models, Rear-Dump and Bottom-Dump, are built *throughout* for long lasting, efficient off-the-highway service.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

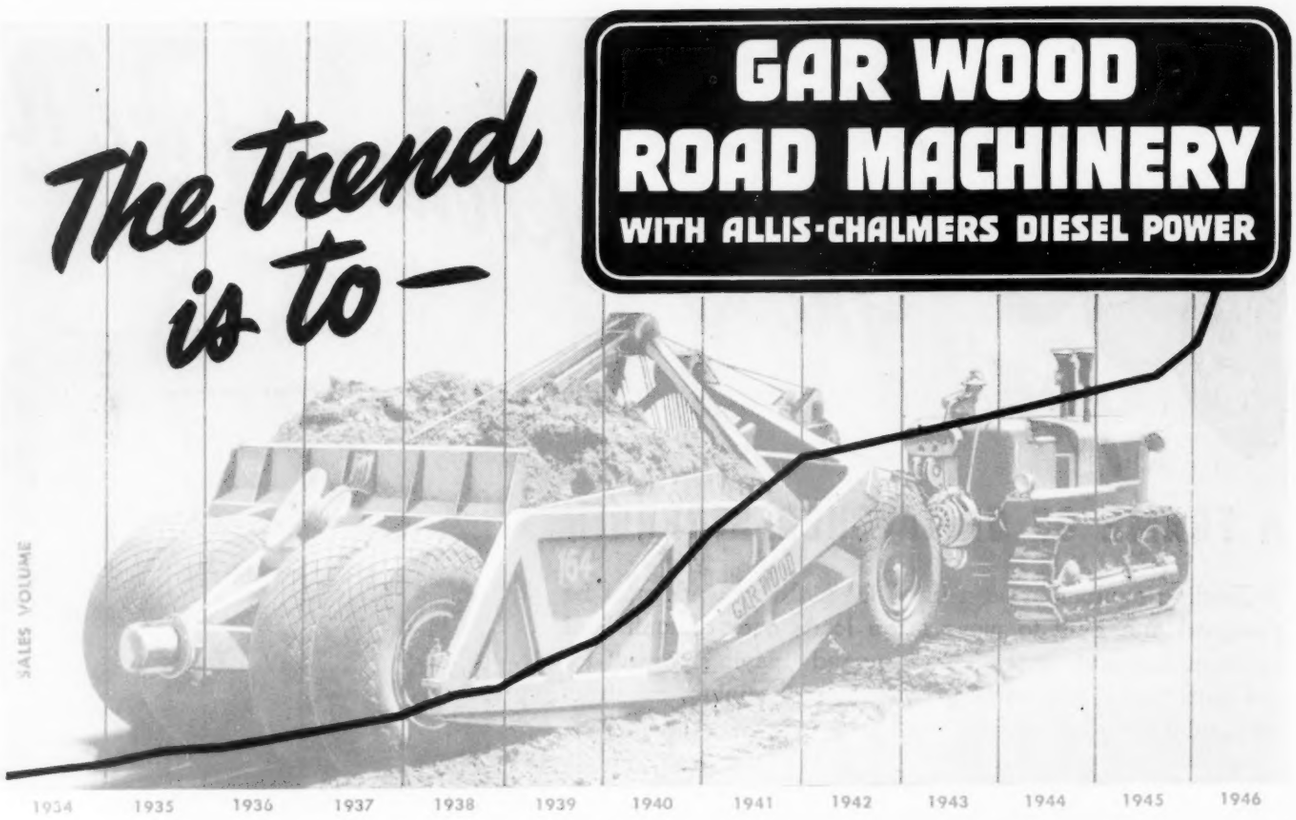


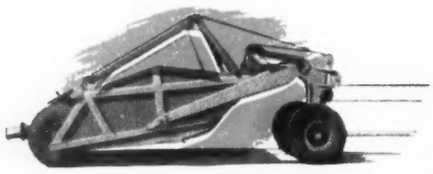
(1) Heavy steel "I" beams (2) large tubular torque members (3) Box section front torque member (4) Body support pads (5) Rubber-mounted pivot shaft bushings.

EUCLIDS *Move the Earth*

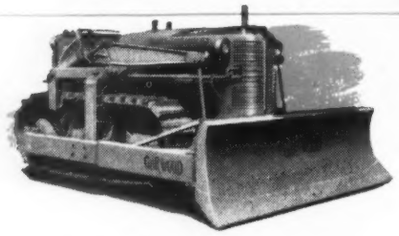
GAR WOOD ROAD MACHINERY
WITH ALLIS-CHALMERS DIESEL POWER

The trend is to—





4-WHEEL CABLE SCRAPERS
Capacities: 11-15-20-25 cu. yds.



HYDRAULIC DOZECASTERS with angling blades, for all Allis-Chalmers Tractors

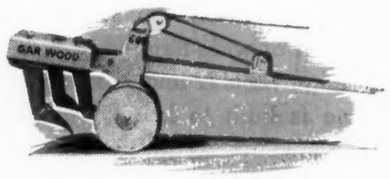
CABLE DOZE-CASTERS with angling blades, for Allis-Chalmers HD-10, HD-14 and HD-14C Tractors

On every kind of earth moving job, throughout the world, Gar Wood Road Machinery has made good, setting new high standards of performance and workmanship.

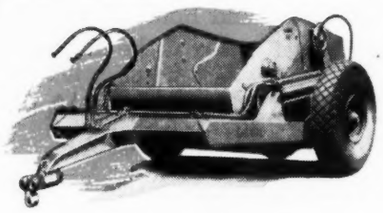
As a result, the demand for this equipment has steadily grown over a period of many years (see chart above) until now it has reached the proportions of a world-wide trend.

Here is a sound reason for specifying Gar Wood earth moving units. "Nothing succeeds like success."

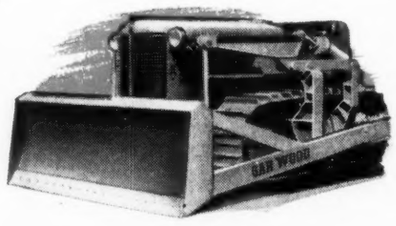
Contact your Allis-Chalmers dealer. Let him point out the superior features of Gar Wood Road Machinery and show you actual job performance in your territory with many satisfied users.



HEAVY DUTY RIPPERS
Cable and hydraulically operated



2-WHEEL HYDRAULIC SCRAPERS
Capacities: 3-5-6-8 cu. yds.



HYDRAULIC BULLDOZERS with fixed blades, for all Allis-Chalmers Tractors.

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OTHER PRODUCTS OF GAR WOOD INDUSTRIES INCLUDE: HOISTS AND BODIES • WINCHES AND CRANES • TANKS • HEATING EQUIPMENT • MOTOR BOATS

Two-way traction tire has new kind of bruise-resisting construction

ROCK and dirt hauling, especially in wet weather, used to cause a lot of tire headaches. Heavy loads strained the tire body. Severe grades increased traction and slippage problems. Rocky terrain made tire life worse—for when tires hit rocks, ruts, etc., under load, the walloping blows led to bruises, ply separation, and blow-outs. Costly delays and repairs resulted.

B. F. Goodrich engineers took over the headaches. They designed a new tread with thick, heavy lugs—but designed it so that the natural running action pushed mud and dirt toward the edges. The tire stayed clean. It gave excellent traction and protection against side slippage. And—it gave equal traction in *either* direction.

Then the engineers developed an entirely new construction principle—the *shock shield*. This shock shield is a set of four breakers—layers of rubber-coated rayon cords—built in between the tread and the plies. These breakers are in pairs, with the cords in each pair running parallel to each other—but with each pair running in opposite directions to give balanced strength. The breakers are cushioned with thick layers of special shock-resistant rubber.

Under impact, the cords in the breakers stretch together, *not* across each other, and return to their original position. The blow is *distributed* and *absorbed* by the rubber cushions; the shock passed on to the cord body is greatly reduced.

This tire is called The Universal (shown above on truck in foreground). Users report fewer bruises, lower repair bills, longer wear, and that more tires can be retreaded. One operator's records show an average of over 4000 hours from B. F. Goodrich tires built this new way, compared to 1600 hours from another make. Others report similar savings.

You can save with B. F. Goodrich off-the-road tires—tires built to meet *your* needs. Find out more about them. See the B. F. Goodrich dealer, or write us direct. *The B. F. Goodrich Company, Akron, Ohio.*

Truck Tires BY

B.F. Goodrich

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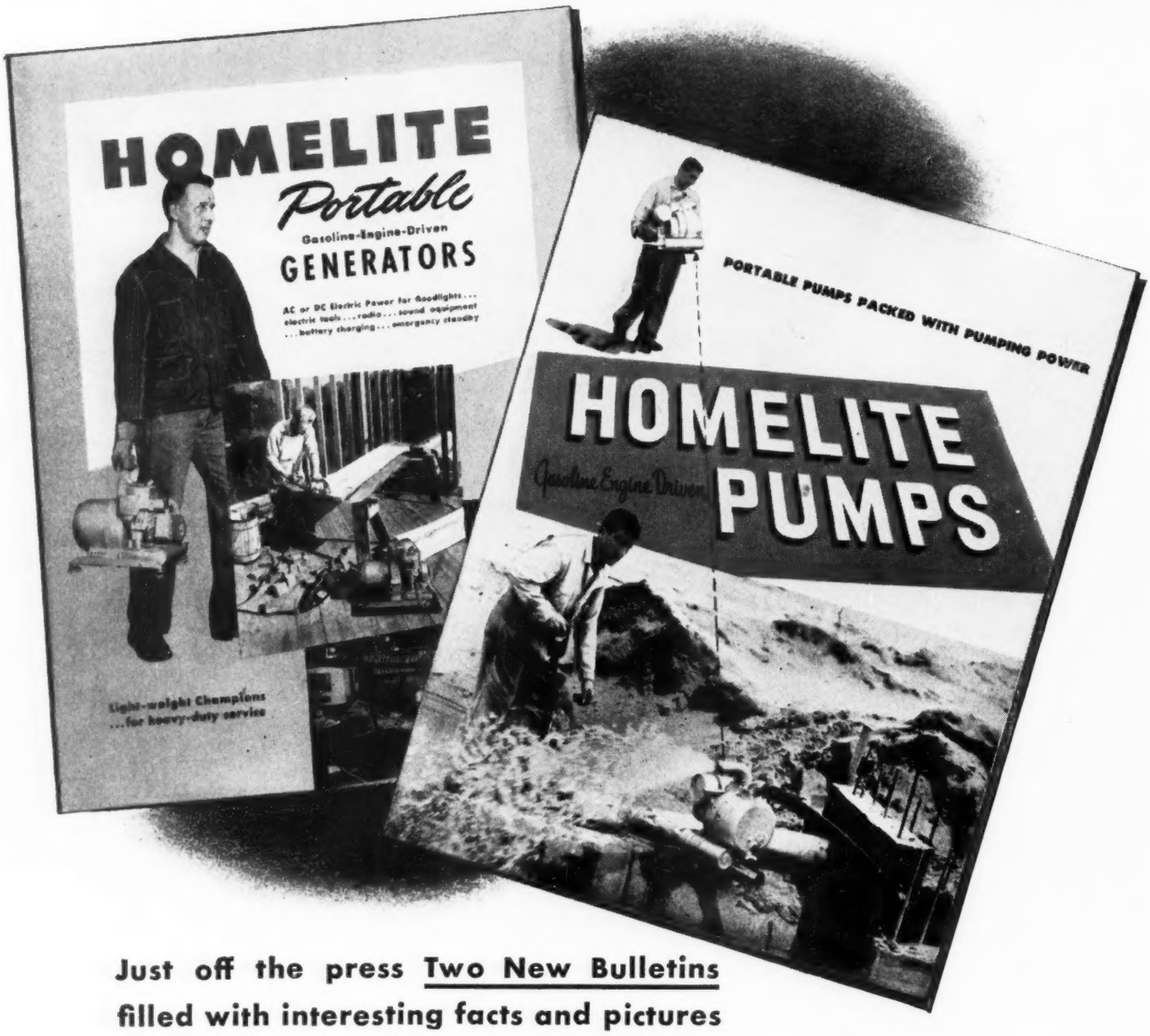

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filled with interesting facts and pictures

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- ★ See their new light weight, capacity and output.
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The "Feather-Touch" Clutch Control makes operation easy, keeps the output curve up throughout the day, makes spotting the load faster and easier and reduces the banging up of the batch bin. Uniform Pressure Swing Clutches eliminate the jerks and jars present with ordinary swing clutches and assure longer life, smoother operation, less time down for replacement or adjustment. Northwest Crawlers give smoother travel. Front-end cab and window design provides for easy vision and there is a choice of boom hoists that provide for live boom operation independent of all other functions at the will of the operator. Everything has been incorporated to assure a smooth running job that will keep the plant ahead of the paver. There are 18 sizes—4 to 44 tons capacity! Ask for further details.

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STANDARD ENGINEERS NOTEBOOK

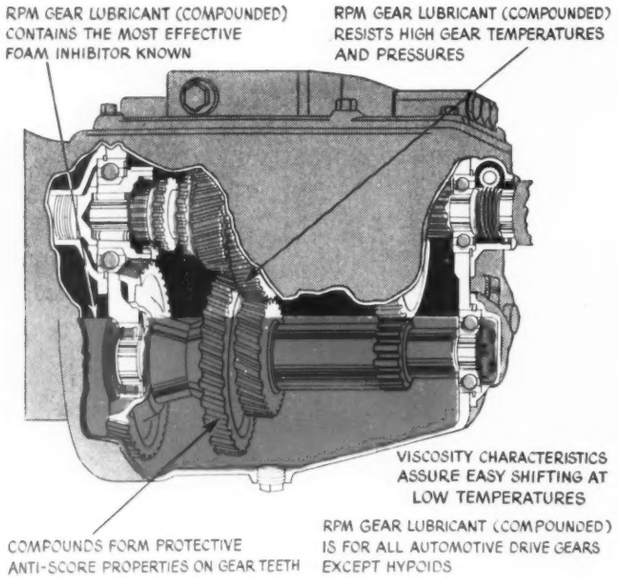
Compounded lubricant prevents gear scoring

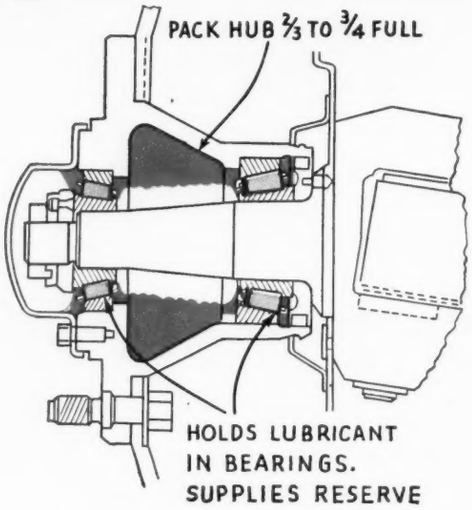
Many operators of automotive equipment have eliminated transmission and differential trouble by switching to RPM Gear Lubricant (Compounded). It is recommended for all transmissions and all conventional differentials. (RPM Hypoid Lubricant should be used in hypoid differentials.)

The compounds in RPM Gear Lubricant assure that a tough, oily film will remain on gears when pressure and heat become excessive. A highly effective foam inhibitor prevents retention of air in lubricant, poor distribution and "boiling up" to cause leaks.

RPM Gear Lubricant (Compounded) is non-corrosive. It comes in four grades: SAE 80, 90, 140, 250.

For complete information about automotive drive gears and their lubricants, write for the new, free booklet: "The Lubrication of Automotive Gears."


RPM GEAR LUBRICANT (COMPOUNDED) CONTAINS THE MOST EFFECTIVE FOAM INHIBITOR KNOWN
RPM GEAR LUBRICANT (COMPOUNDED) RESISTS HIGH GEAR TEMPERATURES AND PRESSURES
VISCOSITY CHARACTERISTICS ASSURE EASY SHIFTING AT LOW TEMPERATURES
COMPOUNDS FORM PROTECTIVE ANTI-SCORE PROPERTIES ON GEAR TEETH
RPM GEAR LUBRICANT (COMPOUNDED) IS FOR ALL AUTOMOTIVE DRIVE GEARS EXCEPT HYPOIDS



Wheel bearings last with heat-resistant grease

Because RPM Wheel Bearing Grease absorbs the countless shocks on wheel bearings, and stays put in extreme temperatures, it will prolong the life of properly adjusted wheel bearings.

RPM Wheel Bearing Grease is specially made for wheel bearings — both the roller type and the ball type. It will not throw out and melt unduly even in hot weather. In any weather it feeds in the proper amounts onto all parts of bearings providing a uniform, tough lubricant film. The resiliency of this film reduces vibration that might rack wheel bearings and steering gear assemblies.

Water resistant, RPM Wheel Bearing Grease helps bearing seals keep out moisture. It seals out grit and dust, too.

For complete information, write for the free booklets, "How To Service and Lubricate Wheel Bearings." There's one for heavy-duty trucks and trailers and one for light equipment.

For additional information and the name of your nearest Distributor, write Standard of California, 225 Bush Street, San Francisco 20, Calif.; The California Oil Company, 30 Rockefeller Plaza, New York 20, N. Y.; The California Company, 17th and Stout Streets, Denver 1, Col.; Standard Oil Company of Texas, El Paso, Texas.

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FAR AHEAD OF THE FIELD

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Contractors now using "AIR PLUS" Compressors on thousands of jobs will tell you that their smoother performance and abundant air supply, obtained with less demand on engine and compressor and proportionate savings in both fuel and upkeep, have made pre-war engineered compressors completely out-of-date.

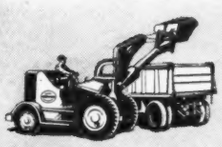
Sizes 60 to 500 ft. Sold and serviced in 120 cities. Ask for Catalog JC-5

Why Buy an Obsolete Compressor When You Can Get a JAEGER?

- **Air-cooled, 2-stage, vertical compressor—built in a balanced "W", full force-feed lubricated — 3 point suspension — interchangeable precision parts.**
- **100% efficient intercooling, automatic drainage.**
- **Massive main frame with recessed fuel tank, 30% to 50% larger air receivers, bigger tool boxes, lifetime clutches, sectional radiators and intercoolers, electric starter, grouped controls, Timken bearing wheels, "Auto-Steer" axle, etc. all standard.**

THE JAEGER MACHINE COMPANY, Columbus 16, Ohio

REGIONAL OFFICES: 8 E. 48th St. NEW YORK 17, N. Y. — 226 N. LaSalle St. CHICAGO 1, ILL. — 235-38 Martin Bldg. BIRMINGHAM 1, ALA.



"FLEET-FOOT" Loaders

"SPEEDLINE" Concrete Mixers

"SURE PRIME" Contractors Pumps

JAEGER *Engineered* **EQUIPMENT**

JAEGER-LAKEWOOD SPREADERS, FINISHERS AND BITUMINOUS PAVERS, FORMS, FORM TAMPERS—"DUAL-MIX" TRUCK MIXERS, AGITATORS—JAEGER HOISTING ENGINES, TOWERS

Announcing

Condensed Specifications

CAPACITY: 34 cu. ft. plus 10% on 6% grades. Bucket capacity 55 cu. ft.

LOADING SKIP: 118 in. wide. Renewable discharge spout liner.

SKIP HOIST: Hoist drum tapered and spiral machine grooved. Twin Disc clutch. Timken Bearings. 158 sq. in. braking area.

DRUM: MultiFoote Double Cone, Double Compartment. Machined rollers and roller paths. Renewable liners. Rotary discharge and transfer chutes of high carbon steel, renewable wearing plates.

BOOM: Boom 10 in. channels of high carbon steel. Swings, raises and lowers by power. Length 35 ft.

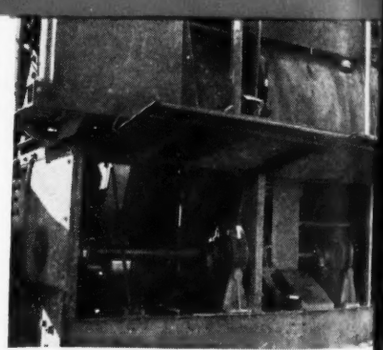
TRACTION: Gear driven. Working speed .6 miles per hr. Travel speed 1.1 miles per hour.

ENGINE: Hercules HXC, piston displacement 779 cu. in. All standard equipment. Power take-off: Twin Disc clutch and a Lovejoy coupling. Diesel power available if desired.

LUBRICATION: All bearings fitted with Alemite-Zelk high pressure grease gun connections.

All the MultiFoote Advantages

A big paver doesn't need to be complicated—look at this simple main drive shaft and clutch assembly! Like the rest of the DuoMix, it is easy to get at, rugged and dependable in operation. Other proved MultiFoote advantages include: Sealed in oil helical-cut-gear power take-off; Timken bearings on all high-speed shafts; MultiFoote Double Cone Drums for thorough mixing; no-pressure water system with large standby tank; wide, solid, fast-charging skip; high, full-visibility operating platform; fast traveling bucket with all mechanism outside; and heavy cross-braced main frame.



New, Exclusive Crawler Design

No "nutcracker" action between treads on this crawler! Exclusive MultiFoote design provides interlocking joints between alloy cast steel tread plates which prevent entry of stones, no matter what position the tread is in. Single drive lugs, on alternate sides of successive treads are completely self-cleaning and have a ball-and-socket action for uniform bearing pressure even on rough ground.

ARMY E NAVY

Three Army-Navy "E" awards for The Foote Company!

MULTIFOOTE

Duo Mix

DUAL DRU

the MULTIFOOTE *Duo Mix*

(DUAL DRUM) 34-E CONCRETE PAVER

High Speed • Real Maneuverability
MultiFoote Dependability for Better Profit Margins on Your Contracts . . .

HERE are a few of the basic facts about the new MultiFoote DuoMix 34-E Concrete Paver—though you'll have to see this simple, rugged machine in action to fully appreciate all the features for smoothness and speed that made the first contractor who tested it insist on buying the pilot model after the trials were completed.

Mechanical delays in the fully automatic mixing cycle have been cut to a minimum—seconds and fractions of seconds clipped from charging, transfer, discharging and dumping add up to extra, profit-making batches on each day's work . . . Main problem on test jobs was to get batch trucks coming fast enough to give the DuoMix a fair workout. Under heavy work schedules, there has been no time out for alterations or repairs—MultiFoote dependability worthy of the long line of Foote pavers.

Traveling on narrow shoulders and soft grades brings reports that the MultiFoote DuoMix is "light on its feet," and highly maneuverable for a paver of this size. Details on the exclusive new traction are given at left.

Your order should be in soon for early delivery. Check with your MultiFoote Distributor or write direct today for complete information.

THE FOOTE CO., INC. **1910 State St.** **Nunda, N. Y.**

34-E CONCRETE PAVER

ADNUN Black Top Pavers

MULTIFOOTE 27-E • SINGLE DRUM 34-E

HALF MILLION YARDS MOVED OVER STEEP

Loads heaped to spring-pipe, 11 pay yards in 75', one minute.

40 to 50% downgrades, 27% adverse return grades, all in a day's work for Nate Moore's 9 TOURNAPULLS

To provide fill for a building site at Camp Pendleton, Oceanside, California, Nathan A. Moore is using 9 Tournapulls to move 500,000 of his estimated 700,000 cubic yards, under conditions that are really rugged.

Sandstone-Clay Ripped out of Mountainside

Borrow is located on a mountainside, ½ mile from fill. Material is sandstone mixed with clay, heavy but dry, rooted for fast loading. Tournapulls are pusher loaded in 75', taking one minute average to heap to the spring pipe. Despite voids, loads average better than 11 pay yards.

Part of the loads (about 10 to 15%) were taken down the mountainside over a 500' ramp. Started at 50% grade this had been worked down to around 40% when these pictures were taken.

Return haul includes 0.2 mile of 27% adverse grade, climbed by Tournapulls in 2nd gear.

Fleet output 99 loads in 2 hours

During a two hour time study the 9 Tournapulls delivered 99 heaped loads to the fill on the 1 mile round-trip haul, a total of 1089 pay yards. Confirming this figure as conservative is the claim of the job superintendent that the Tournapulls are placing 6,000 yards on the fill each 9-hour shift.

Check Tournapull estimate on your jobs

Considering grades encountered and type of material loaded, this job performance is typical of field evidence coming in daily to show what Tournapulls can do to give you lowest-net-cost-per-yard under your job conditions. Your nearest LeTourneau Distributor has facts and figures that will interest you. See him today!

Fleet works rooted material along entire cut. Note loading paths down steep bank.

S of TOUGH MATERIAL
P GRADES with TOURNAPULLS

Rooted Sandstone . . . LeTourneau heavy-duty Rooter breaks up sandstone and dry clay to speed Tournapull loading.

27% Return Grade . . . Tournapulls climb 1000 feet along this 27% grade up the mountain, making it easily in 2nd gear.

40 to 50% Down Grade . . . on this 500' slope. (Check slope with plumb line of falling dirt). On grades like this, pushers are not needed to obtain good loads.

LETOURNEAU
PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

JOB-PROVED
Over 4200 Built and Shipped

TOURNAPULLS®

® Trade Mark Reg. U. S. Pat. Off.

HIT IT

GREASE SPLATTERS

Even a light blow sends ordinary chassis lubricant flying in all directions — leaving parts unprotected.

MARFAK STAYS PUT

Hit it as hard as you can, *Marfak* cushions the blow, doesn't splatter — stays in the chassis bearings.

TEXACO

TEXACO

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON SUNDAY NIGHTS

HARD

Find out why maintenance costs less

THIS simple "hammer test" proves that *Texaco Marfak* is super-tough, adhesive and cohesive — stays right where you put it despite heavy loads and hammering shocks. It gives greater protection with fewer applications, makes parts last longer. That's why operators everywhere use *Marfak* to reduce maintenance costs.

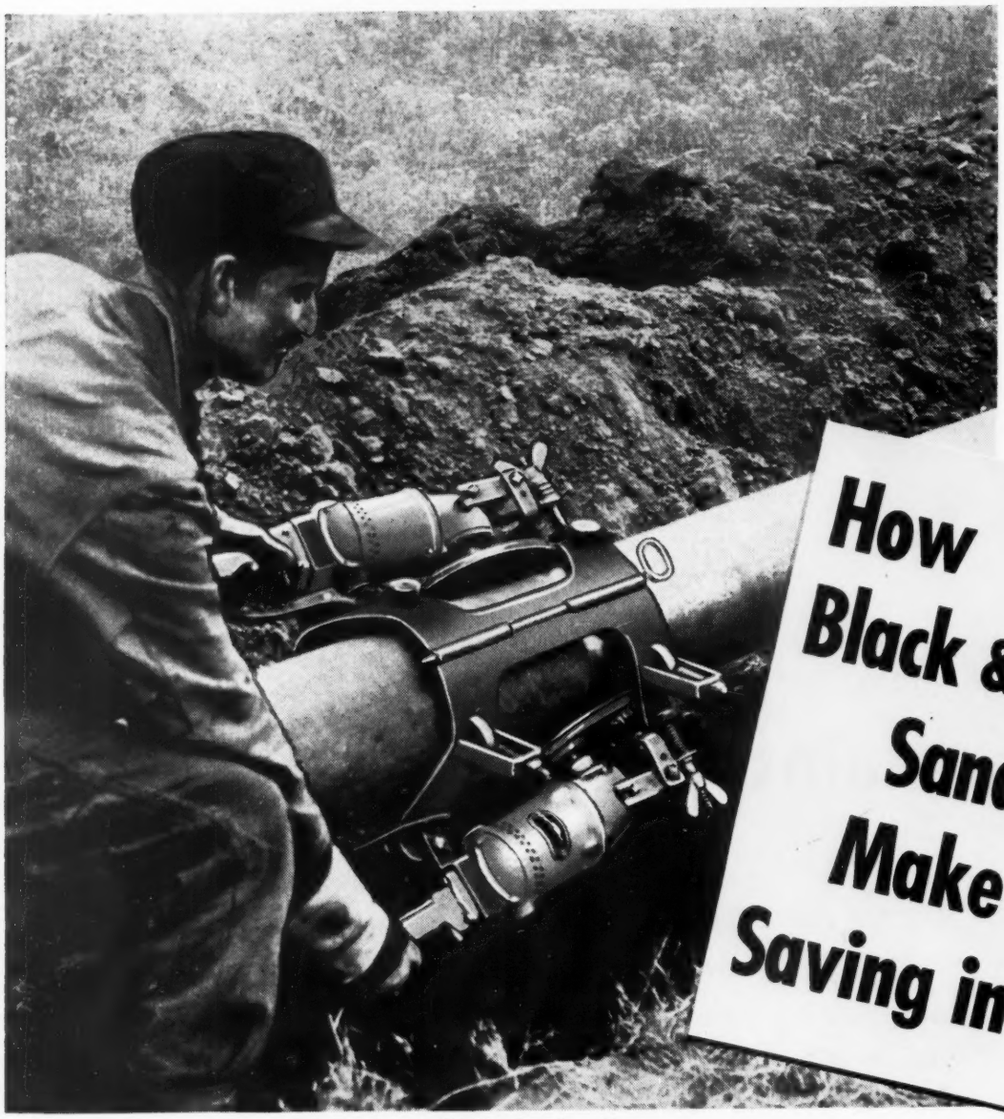
To prolong the life of wheel bearings, use *Texaco Marfak Heavy Duty*. It stays in the bearings despite high speeds, heavy loads and extremes of temperature — sealing out dirt and moisture, sealing itself in, assuring safer braking. No seasonal change is required.

For Texaco Products and Engineering Service, call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

METROPOLITAN OPERA BROADCASTS SATURDAY AFTERNOONS



The rig holding the Black & Decker Sanders is a cradle fitted around the pipe and riding on eight spring tension casters. Ball and swivel bearings contribute to smoother, easier running.

How Black & Decker Sanders Make Big Saving in Time

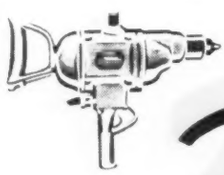
Photograph taken in the Carney, Okla., fields of the Phillips Petroleum Company.

Special Rig Speeds Up Oil Line Pipe Cleaning

Cleaning the exterior of an oil line pipe before it is wrapped in coated paper and buried underground is necessary to prevent rusting and corrosion. Phillips Petroleum Co. uses two Black & Decker Heavy-Duty Portable Electric Sanders in a special rig; reports it *many times faster* than hand operation. Further advantages: smooth, continuous operation of the Sanders . . . even pressure on the sanding disc . . . less operator fatigue . . . longer Sander life . . . easier, safer to sand bottom of pipe.

Saving time and cutting costs in special set-ups such as this is only part of a Black & Decker Sander's job. These versatile tools may also be equipped with abrasive discs in 19 different grains . . . Wire Cup Brushes . . . Saucer or Cup-type Grinding Wheels . . . and Rotary Gouging and Planing Heads . . . to handle a tremendous variety of jobs. The most popular models are the 7″ Standard Sander and the 7″ Heavy-Duty Sander.

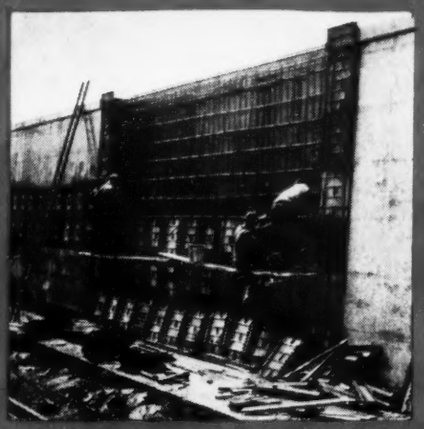
Exceptionally heavy demand still keeps the supply of these Sanders tight . . . so, to insure earliest possible delivery, contact your nearby Black & Decker Distributor . . . they're worth waiting for. For our catalog of over 100 Portable Electric Tools, write to: The Black & Decker Mfg. Co., 659 Pennsylvania Ave., Towson 4, Maryland.



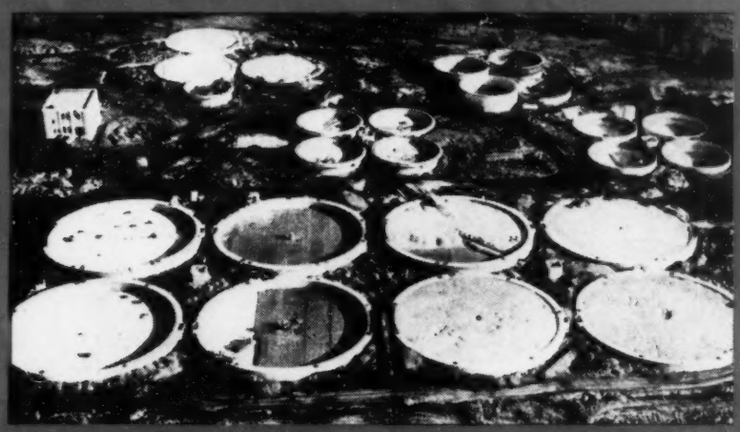
LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker

PORTABLE ELECTRIC TOOLS



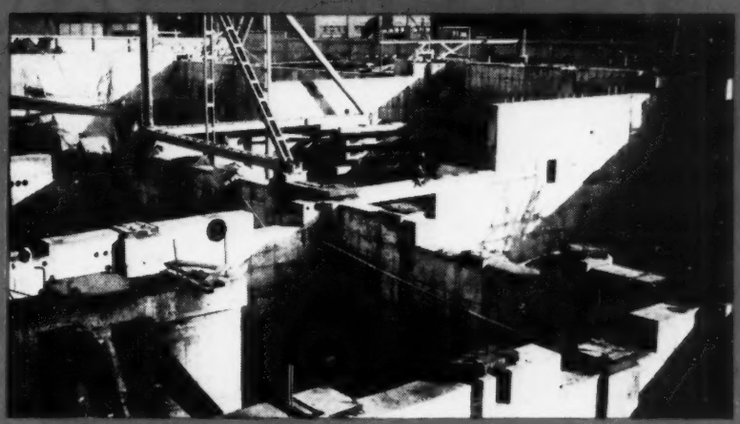
Scaffold Brackets quickly attached to Economy Forms as required. Individual Plate Units removable for inspection, or placing concrete.



SEWAGE AND WATER PLANTS are specially suited to the Economy Method.

Let the FIGURES PROVE the economy...

...of using Economy Steel Forms

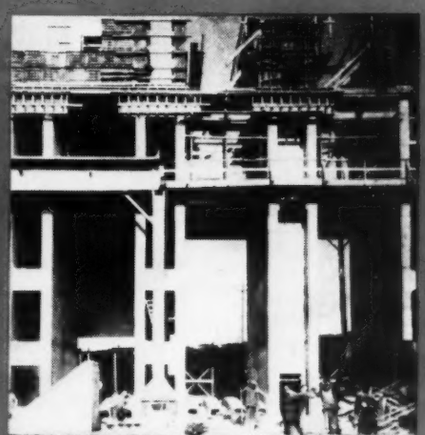


FOUNDATIONS, no matter how intricate, are accurately formed the Economy Way.

Where Concrete enters into Construction, Economy Steel Forms can usually help speed-up the job, yet hold down the cost. With Economy Forms, you get a superior concrete surface, high in water-proofing characteristics and early surface-hardness.

You rent Economy Form equipment — only as much as needed — only as long as needed. With no money tied-up in form-equipment, you save depreciation, taxes, interest, maintenance and warehousing costs.

When you're figuring any job involving concrete, our engineering staff and our conveniently located offices are at your service. You'll have a sounder bid when figured the Economy Way.



Once formed, large panels of Economy Forms can be moved as a unit, a big time-saver on rush jobs like this huge wind-tunnel.

ECONOMY STEEL FORMS

A nation-wide form-rental and engineering service that saves critical material and time in concrete construction. We welcome job inquiries by letter, wire or telephone

ECONOMY FORMS CORP. . . . Home Office: Des Moines, Iowa

BRANCH OFFICES: • Fort Wayne, Indiana • Atlanta, Georgia • Dallas, Texas

ANNOUN

The New P&H

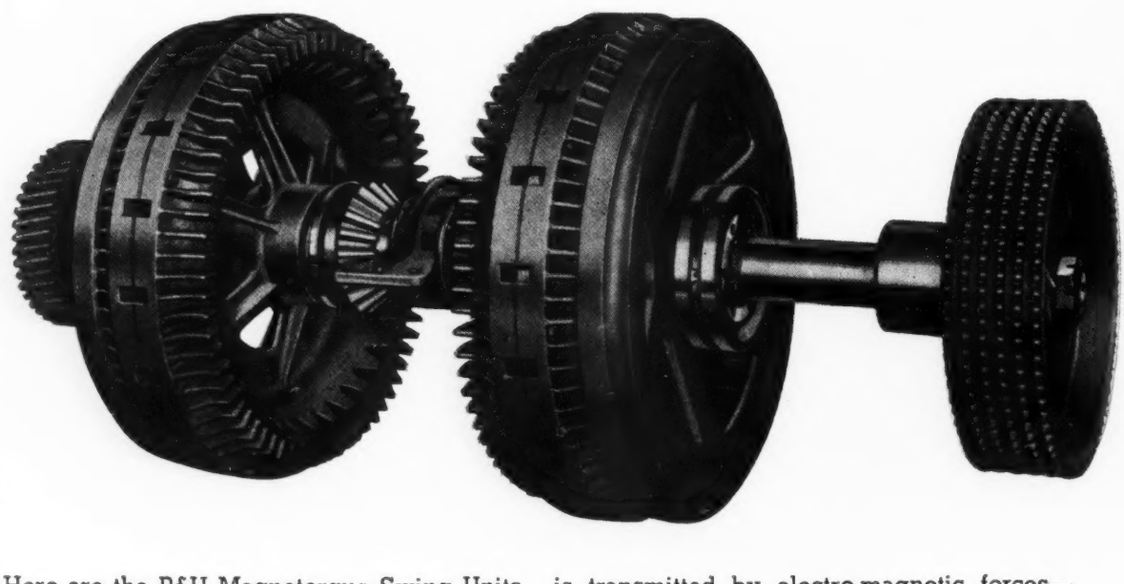
MAGNETORQUE SWING UNIT

Puts an end to swing friction troubles — Another history-making P&H development

For the first time in excavator history, an electric swing unit has been successfully applied to large friction shovels, eliminating the greatest single source of wear and maintenance. The Magnetorque principle is adapted from P&H's large Electric Shovels where it has proved its greater values for over four years.

Here are some of its outstanding advantages:

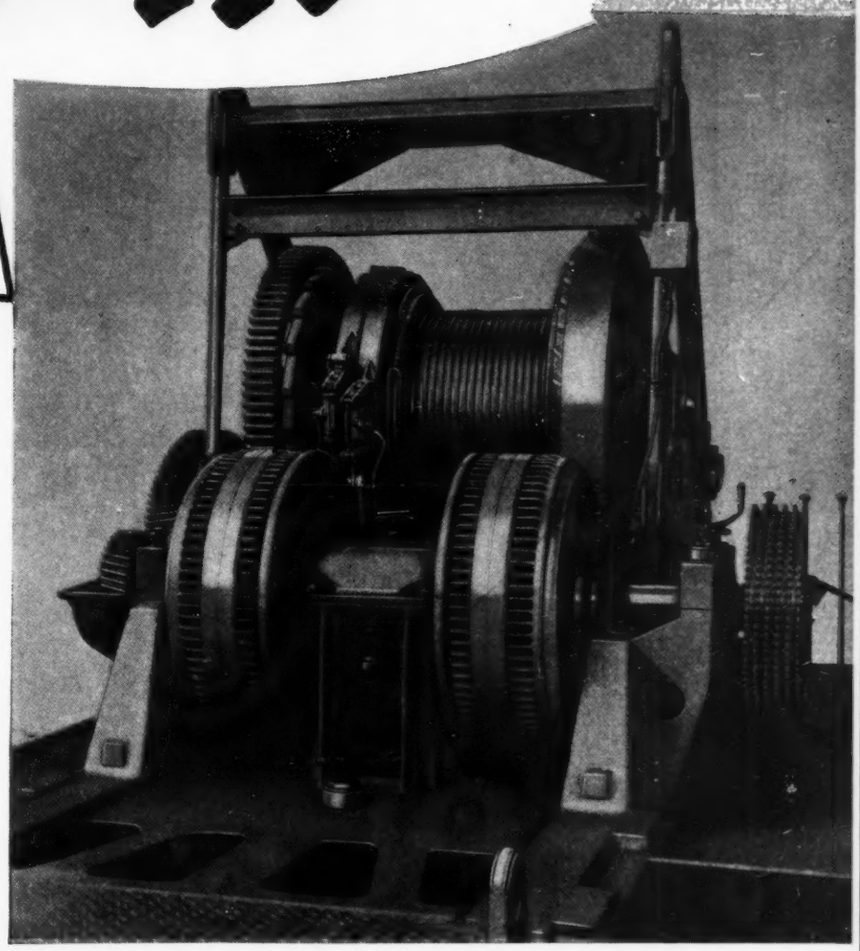
1. It eliminates all friction on swing and propel motions—their adjustment and maintenance.
2. Smoother swinging because power is transmitted entirely by electro-magnetic force.
3. Higher swing speeds, through more accurate and dependable starting and stopping, eliminate waste operating time.
4. Eliminating frictions eliminates layup time—Magnetorque unit will last the life of the machine.
5. Maintenance costs are cut to the bone.
6. More dependable performance greatly increases daily output.



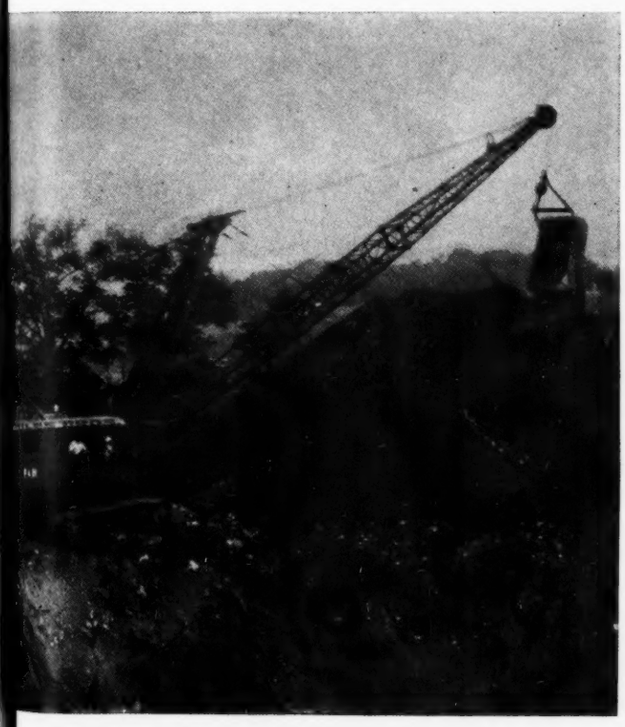
Here are the P&H Magnetorque Swing Units as applied on the new P&H Model 1055. In replacing the usual swing frictions, the greatest single source of wear is eliminated. Power is transmitted by electro-magnetic forces—there is no mechanical contact between driving and driven members.

...CING...

ANOTHER P&H ADDED VALUE!



Rear view of upper deck of P&H Model 1055 with cab removed, showing the 3-bearing jackshaft which embodies the Magnetorque swing units and which is equipped throughout with self-lubricated, anti-friction bearings. Excitation for the Magnetorque swing units, controlled from the operator's station, is supplied by a small generator on the main engine.



P&H Model 1055LC long range dragline equipped with 80 foot boom and 4 yard bucket —on a 100 foot boom it handles a 3 yard bucket.

P&H Model 1055 Heavy Duty Shovel, with 3 cubic yard dipper. All 1055 Models are equipped with such added features as hydraulic control, planetary crowd, planetary boom hoist, etc.

P&H EXCAVATORS

HARNISCHFEGER CORPORATION

EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS

General Offices: 4494 West National Avenue
Milwaukee 14, Wisconsin

Write us for complete information concerning the P&H Magnetorque Swing Unit.

Firestone

Announces

A SENSATIONAL NEW OFF-THE-HIGHWAY TIRE

the Wire Cord

AGAIN Firestone pioneering leads the way with another epochal development — THE FIRESTONE WIRECORD Off-the-Highway Tire.

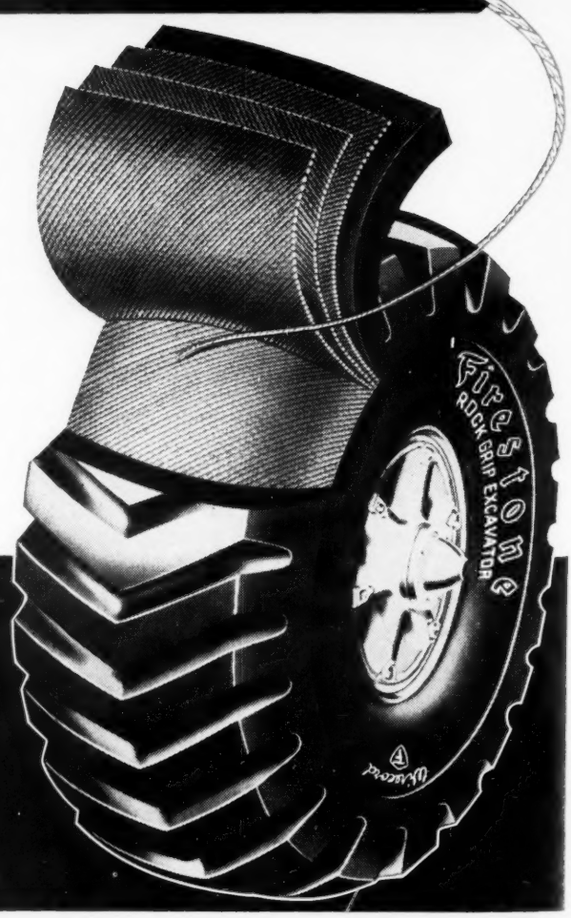
In this, the strongest tire ever built, the body cords are twisted strands of wire. Every cord in every ply is five times as strong as the strongest cord heretofore used.

This cooler-running tire takes unbelievable punishment without blowing out, puncturing, or failing from any of the causes that ruin ordinary tires prematurely.

FIRESTONE WIRECORD Off-the-Highway Tires are now proving their superior performance in logging, strip-mining and other operations where the vehicle is forced to travel over rough roads under heavy loads.

Although not yet in volume production, this amazing new type tire is another example of Firestone's leadership in bringing you the Best Today . . . Still Better Tomorrow.

Copyright, 1946, The Firestone Tire & Rubber Co.



Firestone
Wire Cord
OFF-THE-HIGHWAY TIRE

HAZARD ACCO-LOC Safety Splice
. . . flexible to the end

Exclusive
FEATURES:
1 ACCO-LOC Safety Splice is easy and safe to handle. No seizing wires to loosen; no wire ends to barb.
2 This method of splicing does not distort rope structure. Maintains equalized stresses in all strands.
3 ACCO-LOC Safety Splice is extremely flexible—clear to the terminal, thus permitting close snubbing.
4 Easy to inspect at all times.
5 ACCO-LOC Safety Splice assemblies are made of LAY-SET Preformed wire rope—the safe, kink-resisting, easy-to-handle rope.

Here is a safer, more reliable wire rope ending. It has no awkward, bulky hand-tuck splicing. Instead, a neat, compact, flexible terminal that *always* develops 100% of the rope strength. May be used with any standard fitting. ACCO-LOC Safety Splice assemblies now available in stock sizes. Send today for literature.

ACCO

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TRADE MARK

HAZARD WIRE ROPE DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety

... in CLEVELANDS

Speed, Mobility and Maneuverability

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Ease of Handling and Operation

Low Maintenance and Operating Costs

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CLEVELANDS Save More . . . Because They Do More

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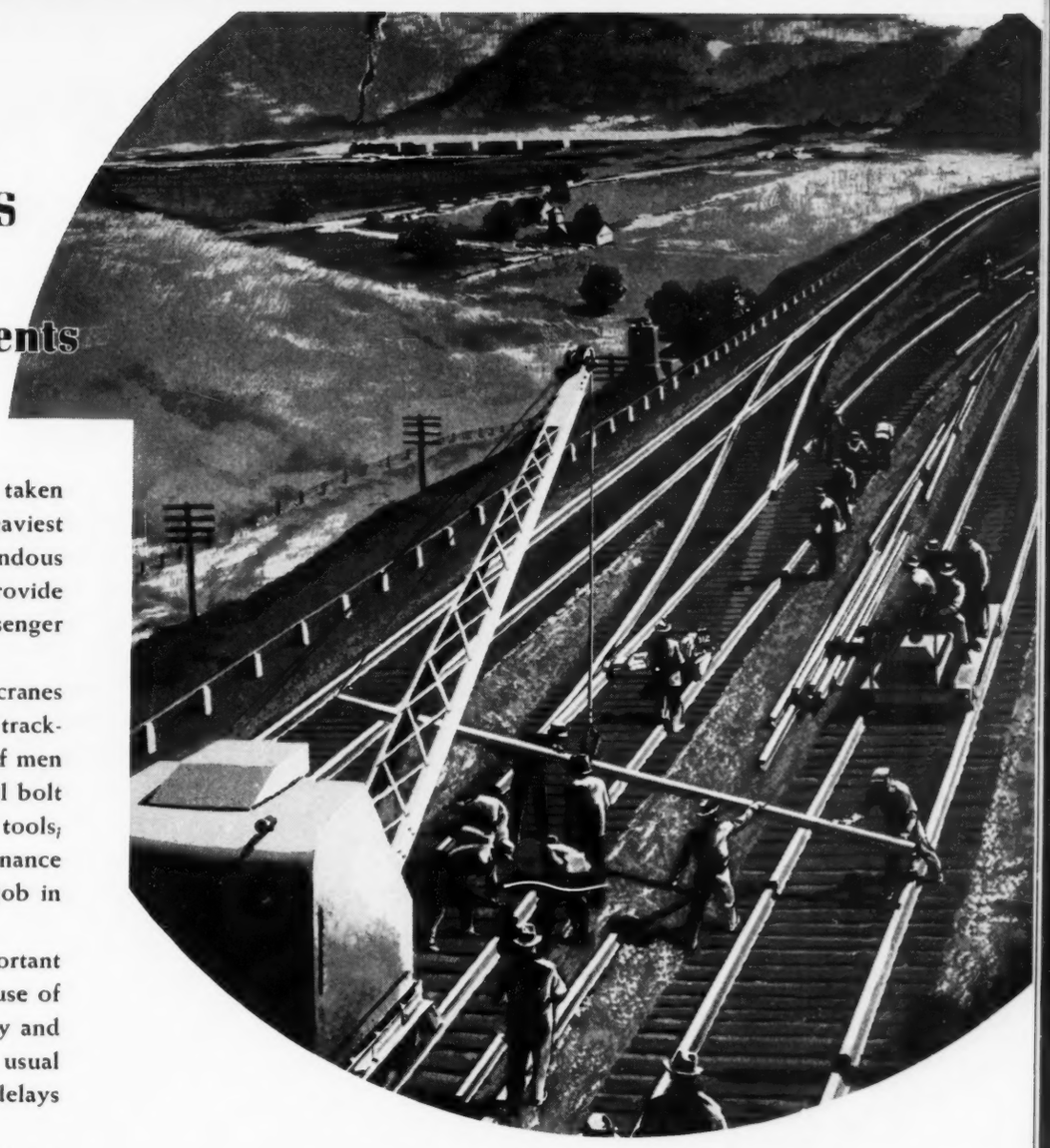
iamond Chain Driven

IME-SAVING POWER EQUIPMENT and TOOLS

Speed Track Improvements



Road beds, ballast, rails, structures have taken constant beating during four years of the heaviest affic in history. Already, however, the tremendous ob of rehabilitation is well under way to provide merica with the finest in freight and passenger ervice she has ever had.

Power equipment and tools help rush this:—cranes hat lift the heaviest rails like sticks of wood; track-ifting machines that do the work of scores of men etter and faster; power machines that drill rail bolt oles in a jiffy; power wrenches and similar tools; nd the latest in railway track motor maintenance nd inspection cars that speed from job to job in hort order.

As with so many machines of industry, important akers of these modern tools also make wide use of iamond Roller Chain Drives. Their reliability and igh maintained efficiency are of more than usual alue when big jobs must be rushed and delays liminated.

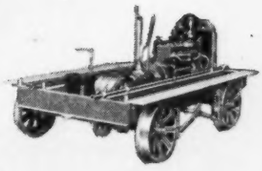
Diamond Roller Chain Drives on the machinery ou buy or manufacture are good insurance of nproved performance. . . . DIAMOND CHAIN MFG. CO., Dept. 418, 402 Kentucky Avenue, ndianapolis 7, Indiana.

Offices and Distributors in All Principal Cities.

DIAMOND ROLLER CHAINS

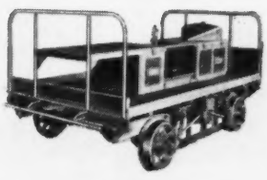
Another popular (Diamond Chain-Driven) railroad inspection car. One of several types made by Fairbanks-Morse.

This enclosed inspection car by Kalamazoo, is Diamond Chain-driven also.

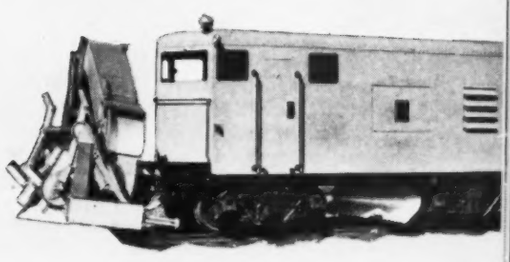


"Northwestern" track motor cars (shown with chain drive exposed) include many popular models.

A popular crane for railroad work, made by Cullen-Friestedt Company.

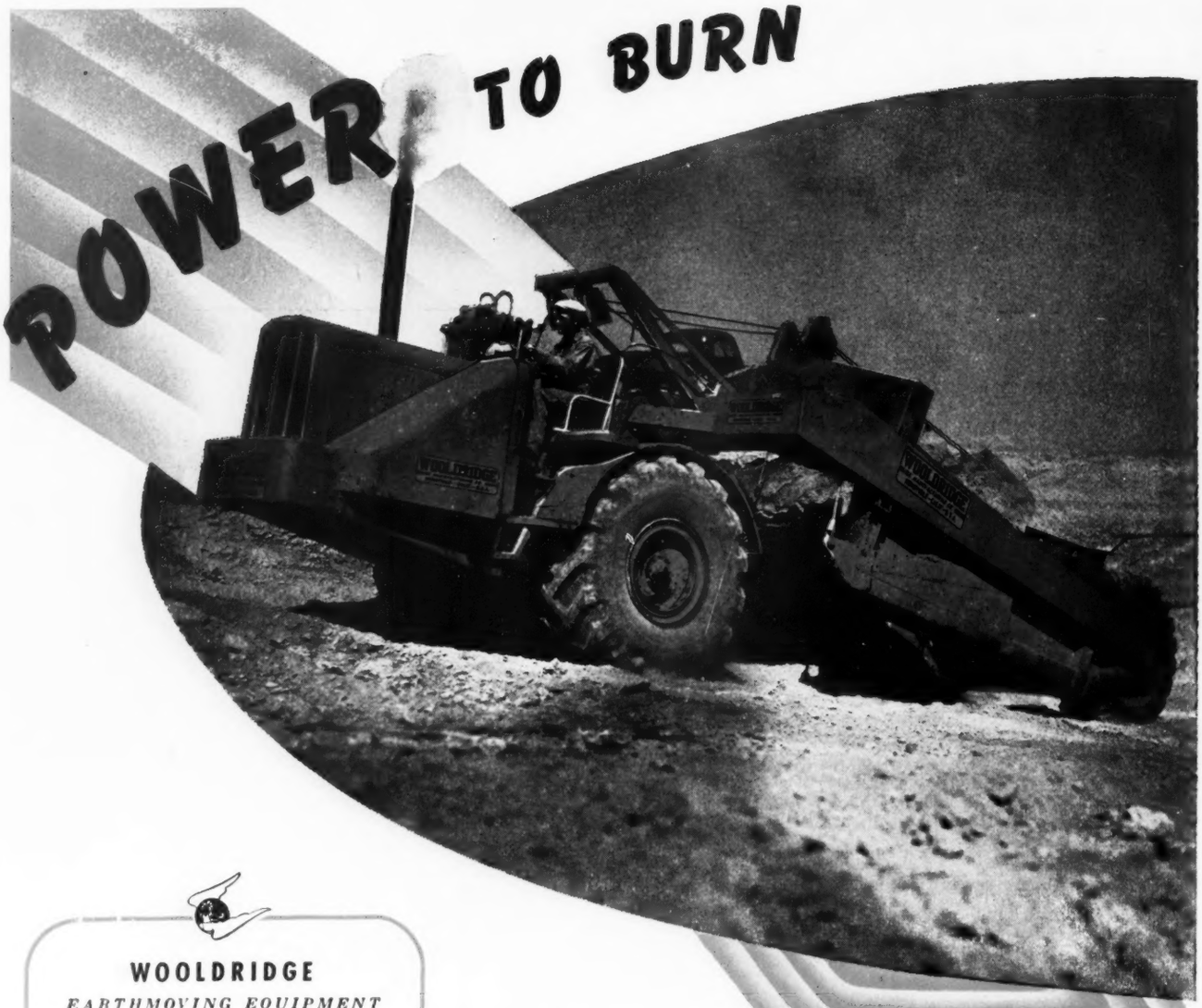


Buda Motor Inspection Car can be adjusted to various track gauges.



Equipment like this made by Wm. Bros Boiler & Mfg. Co., makes the snow fly.

POWER TO BURN



on steep pulls—FULLY LOADED

The Terra-Cobra's massive articulated King-Pin coupling is employed to permit *flexible travel* over rough rocky or uneven ground, at all speeds and with full loads. This exclusive Wooldridge feature permits either or both units to tilt in *opposite* planes even on sharp turns. With maximum load balance on this single pivot there is never any tendency to sky or dip. Get acquainted with Wooldridge today . . . write for Bulletin TA-425 for full details.

WOOLDRIDGE
EARTHMOVING EQUIPMENT
Includes

★ **SCRAPERS**
Tractor-drawn for handling heaping yardages from 6 to 28 cu. yards.

★ **POWER CONTROL UNITS**
Single and multiple drum with universal or roller fairleads.

★ **BULLDOZERS**
Tough and rugged design for standard makes of tractors.

★ **TRAILBUILDERS**
Adjustable angle-blades for standard tractor mounting.

★ **RIPPERS**
Available in light, medium and heavy duty models with two sizes to each model.

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SPEED TO SPARE

WOOLDRIDGE
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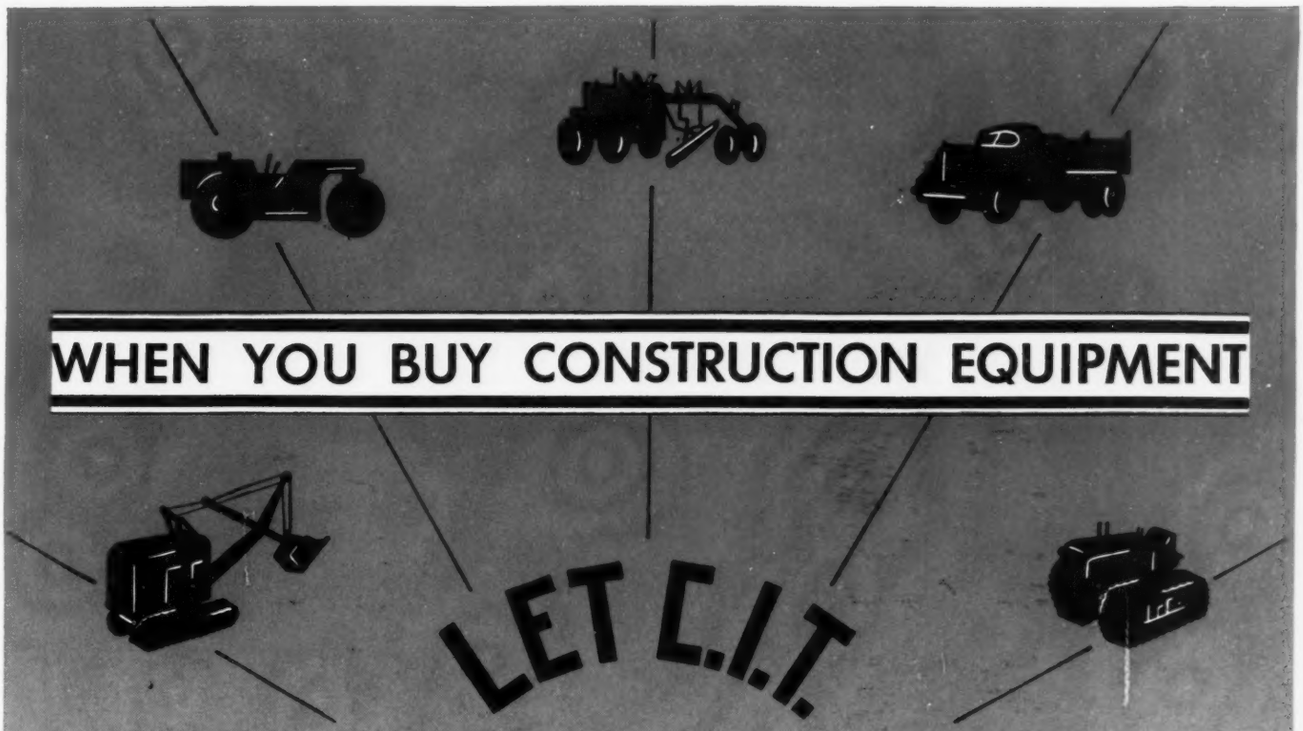
SUNNYVALE · CALIFORNIA · U. S. A.

TERRA COBRA
Hi-Speed Self-Propelled EARTHMOVERS



WHEN YOU BUY CONSTRUCTION EQUIPMENT

LET C.I.T.

FINANCE THE PURCHASE ON EXTENDED TERMS

Instead of using your working capital to buy Construction Equipment LET C.I.T. SUPPLY THE FUNDS . . . amortize the investment over many months . . . keep your funds liquid for payrolls, supplies, operating expenses . . . and for expansion of your business.

By financing your purchases through the C.I.T. Construction Equipment Plan you permit machinery to help pay for itself . . . you own a better assortment of equipment and effect important savings in operating costs . . . earn larger profits through increased production . . . the new equipment starts to pay its own way from the time it goes into operation.

It's easy to arrange C.I.T. financing. When you select the equipment wanted . . . and you can combine purchases from several distributors in one obligation . . . simply tell us the name and make of the equipment, terms on which you wish to buy and balance to be financed. With these simple facts, we'll be able to arrange the necessary details.

Whether you buy one or more items . . . and whether the amount involved is large or small . . . C.I.T. WILL FINANCE THE TRANSACTION AT LOW COST. There are no long, drawn-out negotiations . . . simply get in touch with us and we'll be happy to serve you promptly and efficiently.

Any of these offices will furnish full information upon request

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NEW YORK, N. Y.

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660 Market Street
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C.I.T. CORPORATION

INDUSTRIAL FINANCING

333 N. Michigan Avenue
CHICAGO, ILLINOIS

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CANADIAN ACCEPTANCE CORPORATION *Limited,*
Metropolitan Building
Toronto, Canada

AFFILIATED WITH COMMERCIAL INVESTMENT TRUST INCORPORATED

Power
. . . for successful handling of the toughest digging operations! A Page Walking Dragline powered by two Page Horizontal Diesel Engines *plus* a Page *Automatic* Bucket.
WALKING DRAGLINES • AUTOMATIC BUCKETS
PAGE ENGINEERING COMPANY
CHICAGO 38, ILLINOIS

"He says that Rex doesn't ride . . . it floats!"

Rex is the *only* truck mixer with the cushioning chain belt drive that encircles the drum . . . absorbing road shocks, the jolts of starts and stops with a loaded drum and eliminating vibration.

So effective is the "cushioning" ability of this chain drive that Rex Moto-Mixer drivers are never conscious of vibration . . . concrete evidence that operation of a Rex Moto-Mixer is far less fatiguing on men *and machine.*

Check this and other outstanding Moto-Mixer features with your Rex Distributor. Or, if you prefer, write for your copy of the new Bulletin No. 467 that tells the complete story. Address Chain Belt Company, 1664 West Bruce Street, Milwaukee 4, Wisconsin.

CHAIN BELT COMPANY of *MILWAUKEE*

REX

CONSTRUCTION MACHINERY

PUMPS · PAVERS · PUMPCRETES · MOTO-MIXERS · MIXERS

WORKING CRAWLERS EARN MONEY..

stationary

bad track doesn't mean "days off"

when there's a Rodgers around-

portable

Mr. Contractor

Your dealer probably has Rodgers Track Servicing Presses in his service department for the purpose of helping you maintain your equipment. If he hasn't and your requirements won't justify your having a Rodgers Press of your own, urge him to investigate the savings of a Rodgers. It will pay you both!

RODGERS CRAWLER TRACK PRESSES

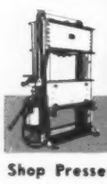
You don't need to "retire" your crawler equipment for a couple of days for track maintenance . . . you don't need a gang, or a sledge, or a torch either — no Sir! — not when there is a Rodgers Track Press on or near the job. That's because a Rodgers will service 2 large strings of track in the average machine time of 3 to 4 hours.

A Rodgers has an exclusive feature in the Retractable Jaw which eliminates lifting the track over a stationary jaw and assures proper bearing support against the inner side of the rail, thus properly spacing the rails, eliminating any binding action — leaves tracks flexible after servicing. And the Rodgers Track Wrench is the handy answer to tight, frozen nuts.

You can get a Rodgers Crawler-Track Press in portable models: 2 wheel trailer or 4 wheels; and in stationary shop models. Write now for complete details; or see your crawler equipment dealer — he will tell you what a Rodgers can do to save you time and labor.

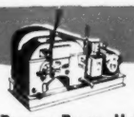
Rodgers Hydraulic, Inc.

hydraulic power equipment

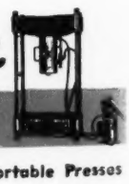


Shop Presses

Crawler-Track Presses



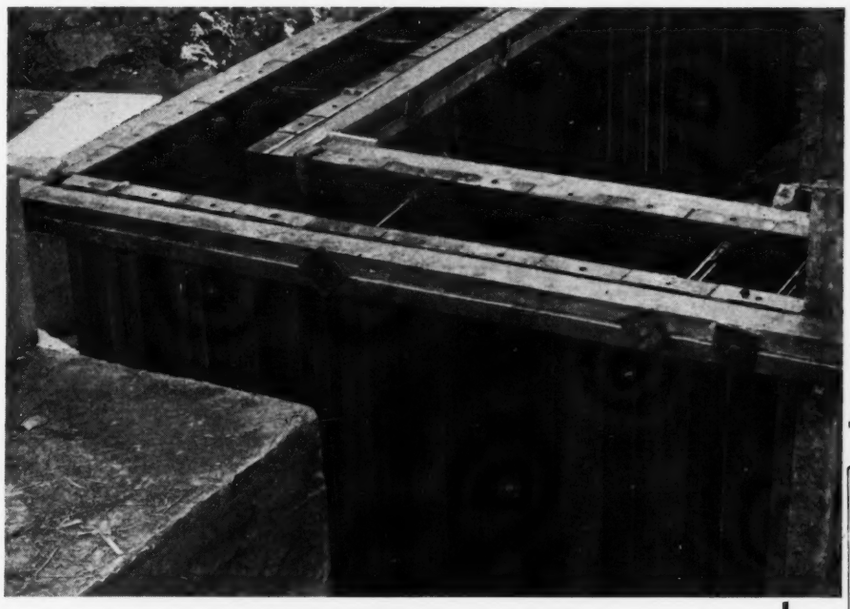
Power Pump Units



Portable Presses

7403 Walker St., St. Louis Park, Minneapolis 16, Minn.

ATLAS LABOR-SAVING *SPEED* FORMS



Speedy Erection—Forms go together quickly with wedge bolts.

Typical corner—Atlas Speed Wall Form.

Three Units of Atlas Speed Wall Forms.

SALE or RENT

ATLAS STEEL FLOOR AND WALL FORMS

Speed Up Concrete Construction

Economical—Records of actual jobs show labor-saving of more than 25% as compared to Plywood forms. Materials compare favorably with Plywood forms.

Light Weight—Average 30 lbs. per unit. One man can handle them.

Accurate—Units line up perfectly straight and fit tightly together eliminating loss of grout.

Lasting—200 uses possible, making cost per use less than 1c per sq. ft.—much less than Plywood.

Finished—Smooth and even. No knot or grain marks. No fins—nothing to remove.

Available—For early delivery.

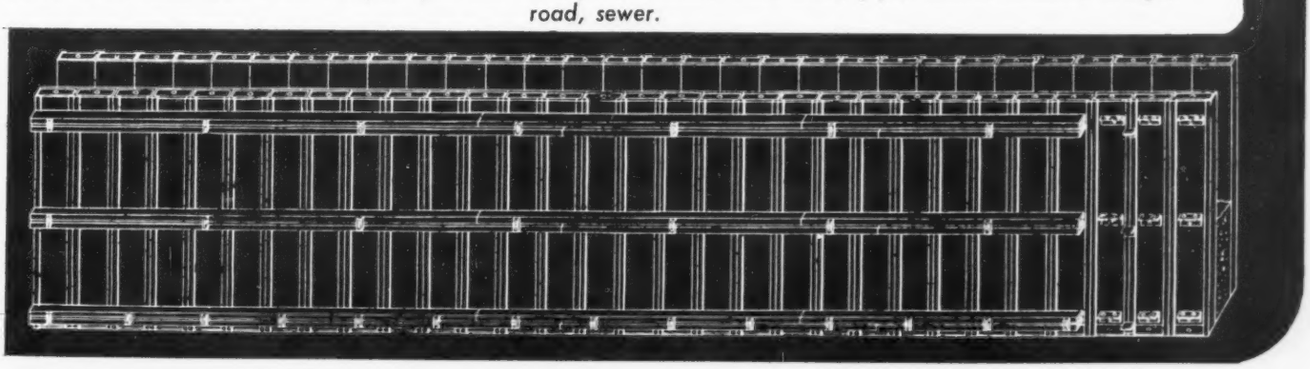
Call Us In To Help With Your Form Work.

Write for Illustrated Folder

IRVINGTON FORM & TANK CORP.

258 LATO STREET **IRVINGTON, N. Y.**

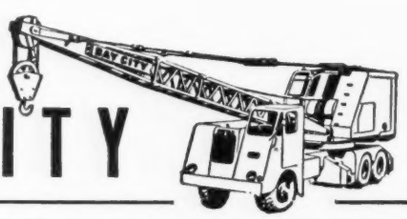
There is an Atlas Steel Form for your job—flat slab, pan, column, wall, floor, pipe, tunnel, caisson, bridge, road, sewer.



PAY DIRT FOR CEMENT PLANTS

BAY CITY shovels strike real pay dirt in loading materials for cement production and in the handling of all other aggregates and bulky materials. Fine balance, high line speeds, and quick response to all controls provide easy maneuverability. Unit-cast lower carbody and revolving table, tandem drums on separate shafts, and heavy duty differential drive assure long, dependable service. For complete information call your nearest BAY CITY dealer today or write direct to BAY CITY SHOVELS, INC., Bay City, Michigan.

AMERICA'S FINEST BUILT BY BAY CITY AND SOLD THROUGHOUT THE WORLD



BAY CITY

SHOVELS • DRAGLINES
CRANES • HOES • CLAMSHELLS

SEE YOUR NEAREST DEALER for Bay City excavating and material handling equipment in sizes from ⅜ to 1¼ yards having crane rating up to 20 tons. Both crawler and pneumatic tire mounting.

THIS *Shouldn't Happen* to a construction job!

An overturned salamander . . . a hot rivet . . . or a welder's torch ignites a canvas windbreak and sets off a furious fire. Thousands of dollars of new construction ruined!

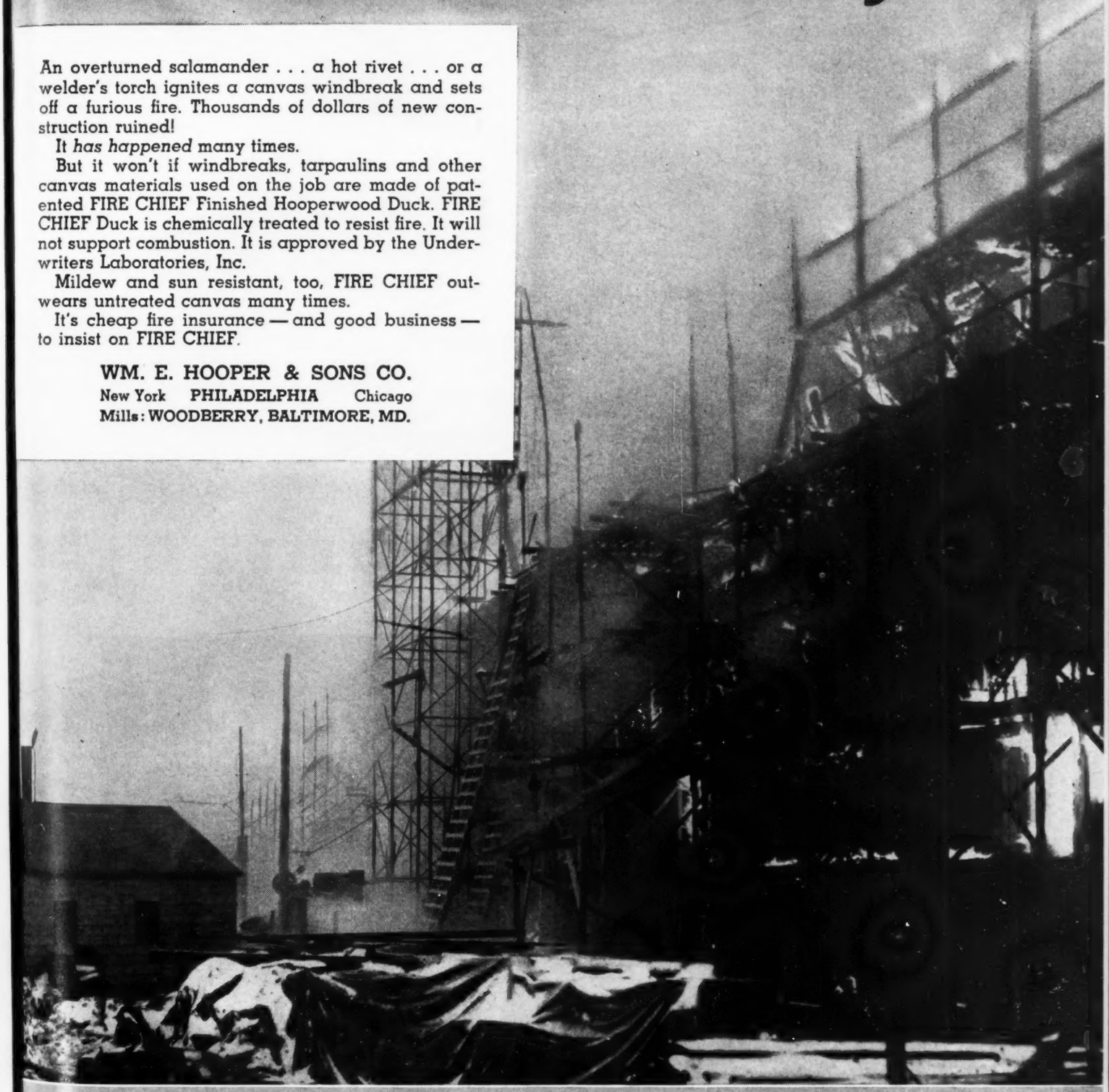
It *has happened* many times.

But it won't if windbreaks, tarpaulins and other canvas materials used on the job are made of patented FIRE CHIEF Finished Hooperwood Duck. FIRE CHIEF Duck is chemically treated to resist fire. It will not support combustion. It is approved by the Underwriters Laboratories, Inc.

Mildew and sun resistant, too, FIRE CHIEF outwears untreated canvas many times.

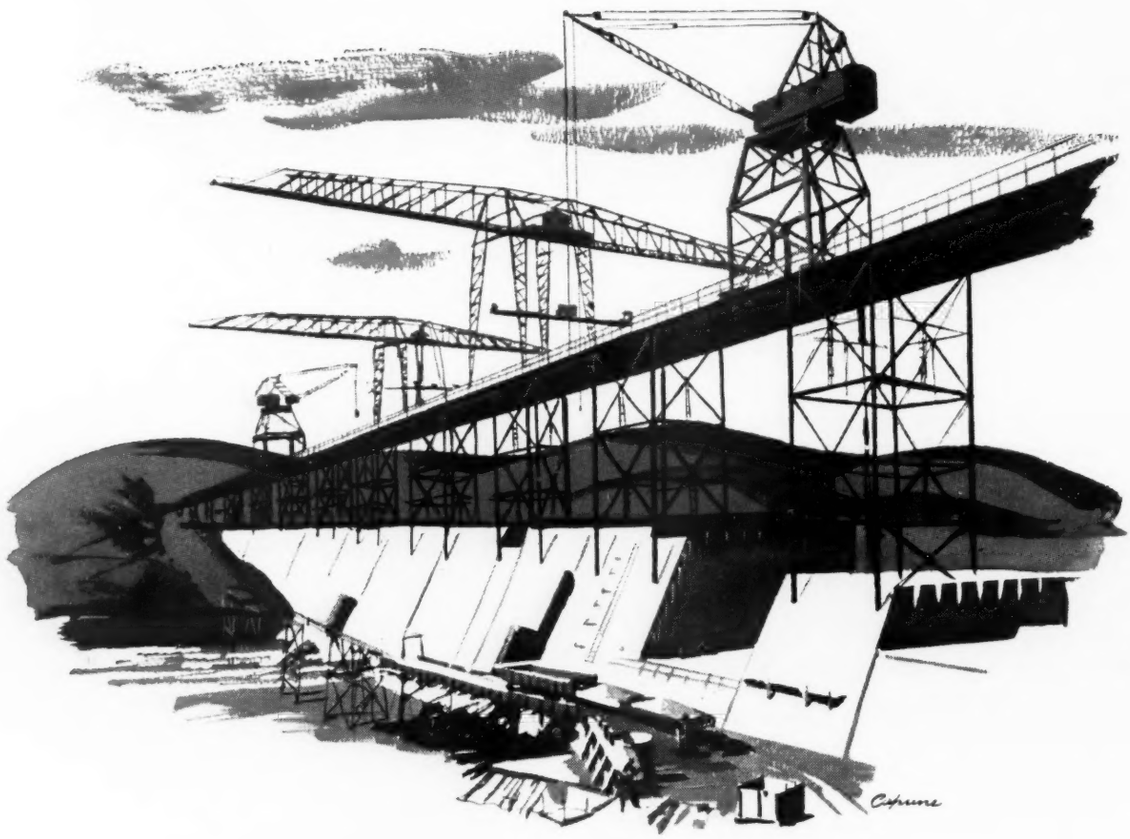
It's cheap fire insurance — and good business — to insist on FIRE CHIEF.

WM. E. HOOPER & SONS CO.
New York **PHILADELPHIA** Chicago
Mills: **WOODBERRY, BALTIMORE, MD.**



Fire-Chief Finished (PATENTED)

HOOPERWOOD COTTON DUCK



SPECIALISTS IN STEEL

Engineers and craftsmen of Consolidated Steel Corporation know their business well. The unusual steel structures shown here are examples of the diversity and precision of their work.

Should your plans call for new construction, consider the capable services of Consolidated Steel. Immediate attention will be given your inquiry. Address Consolidated Steel, Los Angeles 22, California; or Orange, Texas.

LEADERS IN THE WEST AND SOUTH

Consolidated Steel

FABRICATORS
ENGINEERS
CRAFTSMEN

INDUSTRIAL BUILDINGS

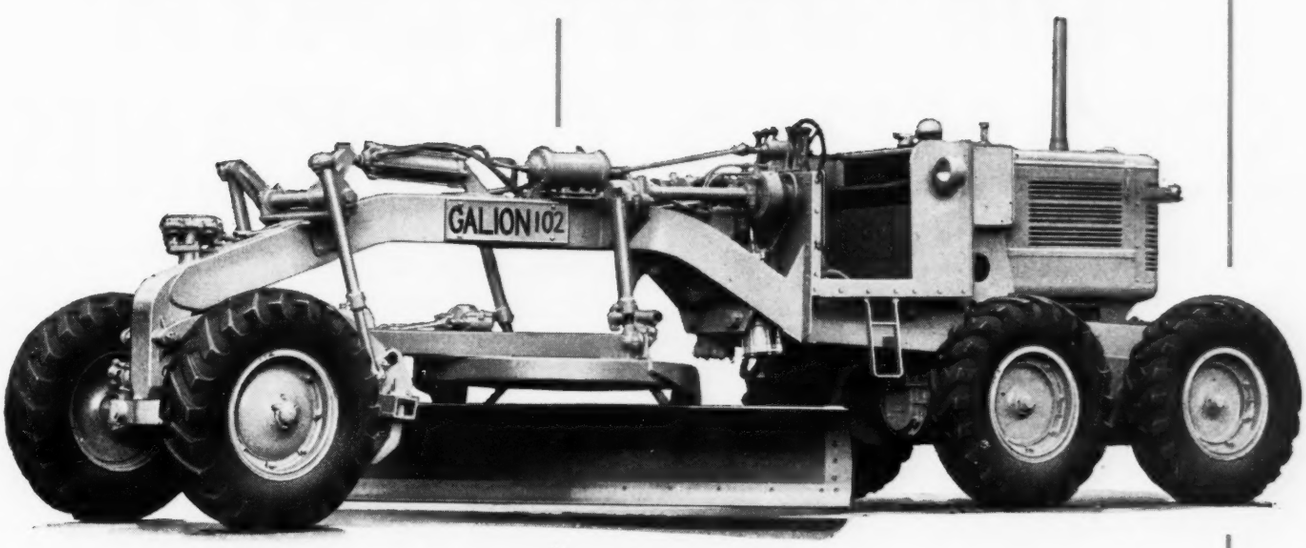
DRUM GATES

STEEL BRIDGES

PETROLEUM EQUIPMENT

TRANSMISSION TOWERS

GO AHEAD . . . . PUT THE PRESSURE ON



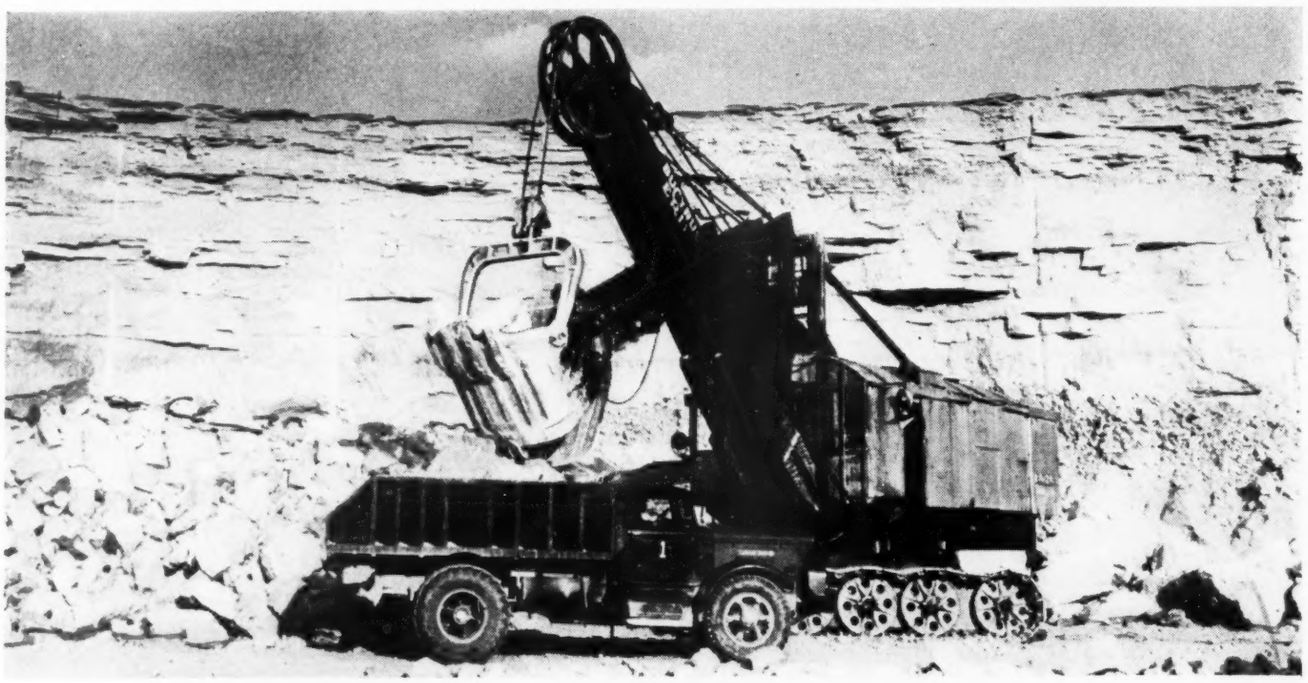
This improved No. 102 motor grader can take it. With a weight range from 22,550 to 24,315 lbs., and a maximum blade pressure, with scarifier, of 13,550 lbs., you will have little trouble on the toughest kind of road work. Then, there is a 68½ H. P. diesel engine to back that up. Also gear-driven tandem drive, complete hydraulic operation, full adjustable blade and many other points to make this model No. 102 outstanding. Put the pressure on us . . . we'll be glad to tell you more.

THE GALION IRON WORKS & MFG. CO.

MAIN OFFICE AND WORKS: GALION, OHIO

DISTRIBUTORS EVERYWHERE

All Point Efficiency with SINCLAIR SPECIALIZED LUBRICANTS



CONTINUOUS *efficient* operation demands no failure of any mechanical part. Good engine lubrication is not enough. Proper ALL-POINT protection is vital. Sinclair lubricants are designed for *specific* service at every individual point.

For *engines*... Opaline Motor Oil provides unvarying, safe lubrication. Its qualities combat ring sticking, resist carbon and crankcase accumulations, help avoid bearing corrosion.

For *gears*... Opaline Gear Lubricant provides extreme pressure properties to prevent galling and scuffing. It resists oxidation, flows freely at low temperatures, and won't foam at high speeds.

For *chassis*... non-dripping Opaline Chassis Lubricant stays put. Its basic oil provides sure lubrication under extreme pressure. For *wheel bearings*... Sincolube meets all requirements of ball and roller bearing engineers. It doesn't thicken or thin out with temperature variations or separate during use.

• • •

Try these specialized lubricants for efficient, economical operation of each important mechanical service.

SINCLAIR AUTOMOTIVE OILS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

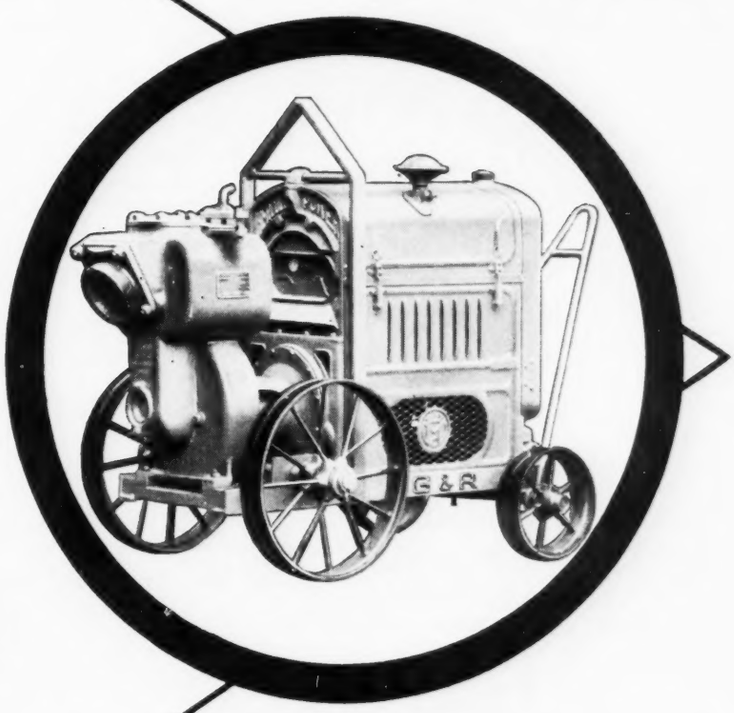
you can't lose on this proposition

IT WON'T COST YOU A CENT TO LEARN THAT GORMAN-RUPP PUMPS ARE YOUR BEST BUY

Fast talking may sell you some other make of de-watering pump. But once on the job the pump must do its own talking – by performance.

When the going is tough – the water is filled with mud and corruption – see how many other pumps can stomach it like a Gorman-Rupp Contractor's BLUE Pump.

Streamlining the outside of a pump doesn't help it pump more hours or more water per gallon of gasoline. Streamlining the inside is what counts.



Ask what you want of a Gorman-Rupp pump. Run it months at a time, without let-up. Give it any kind of test. You will see that no other pump will do the work of a Gorman-Rupp!

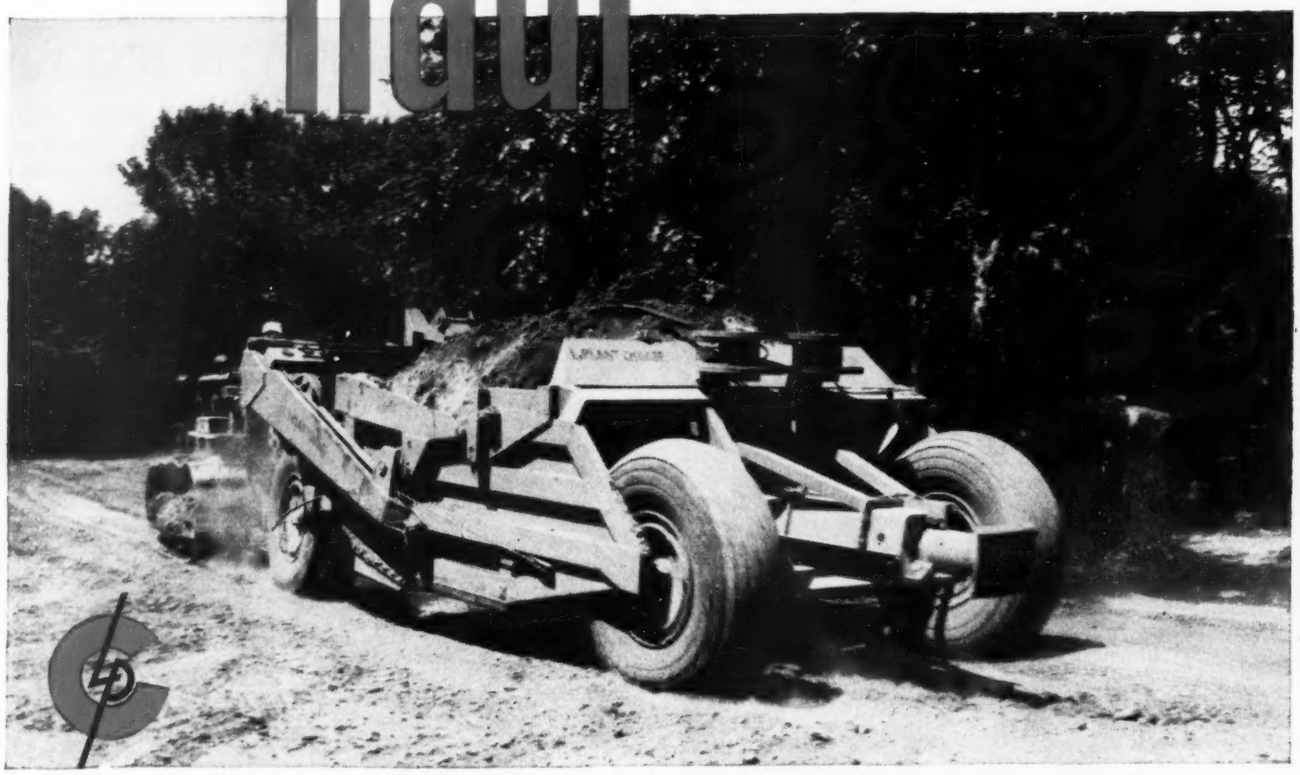
For size of pump, for power consumed, for dollar of investment, Gorman-Rupp pumps will out-perform any other and we are willing to let you prove this to yourself by a free trial with no strings attached. For details, call your nearest distributor.

GORMAN-RUPP PUMPS — UNSURPASSED FOR PUMPING FAST — ARMY E NAVY

THE GORMAN-RUPP COMPANY

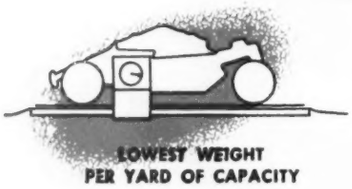
MANSFIELD • OHIO

LOAD... haul ...DUMP...SPREAD

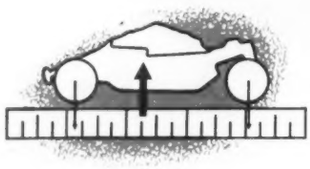


you're yards ahead with

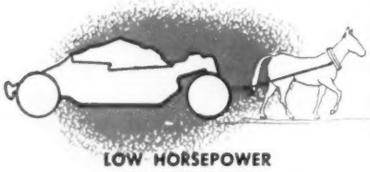
the new LPC *Carrimor**



LOWEST WEIGHT
PER YARD OF CAPACITY



PROPER
WEIGHT DISTRIBUTION



LOW HORSEPOWER
REQUIREMENTS

Once you get a load into a scraper, it's important to get it rolling to the dump—and back again—as quickly as possible. Here again, you'll earn more with a "Carrimor" because it has less dead weight per yard of capacity than any other scraper on the market. This, together with proper weight distribution, reduces horsepower requirements and fuel costs, saves wear and tear on your tractor and enables you to handle peak pay loads with maximum efficiency.

Low center of gravity, low draft and low overall height also mean that the new LPC "Carrimor" trails easier, has greater stability and can be operated anywhere without worrying about overhead clearance. Moreover, the choice of single, over-size single or dual tires assures efficient results under all working conditions. Get the facts and you'll get an LPC—for lowest possible cost per yard. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; Oakland, Calif.

**Trade Mark Registered*

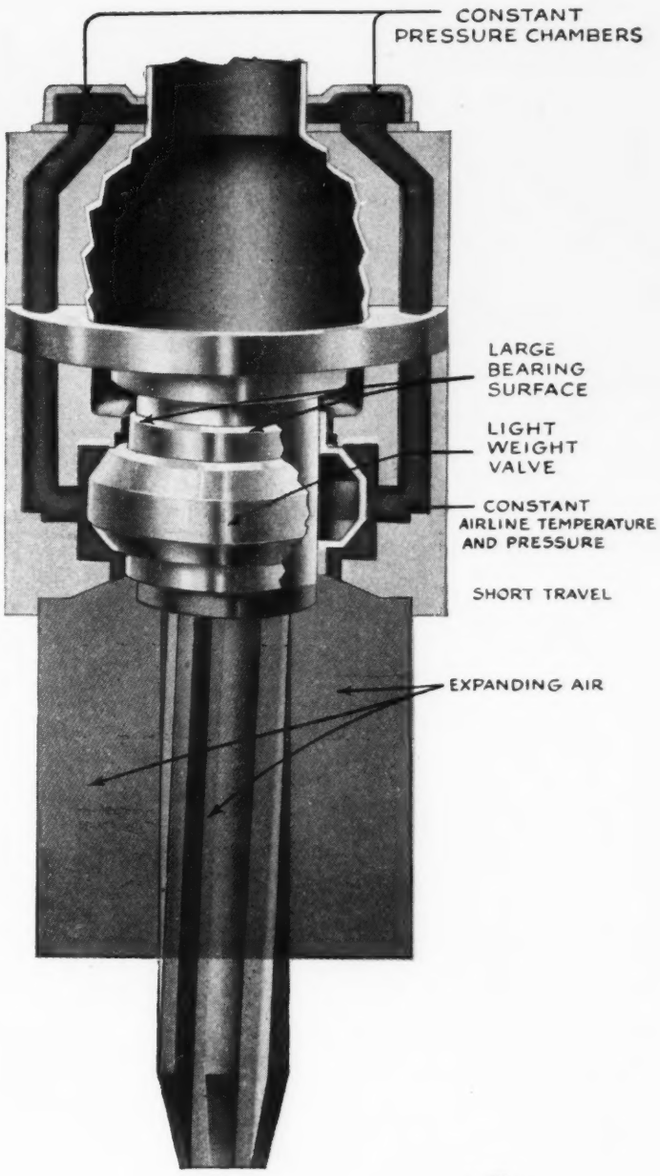
LaPLANT-CHOATE

Engineered Earthmoving

Lowest Possible Cost per yard

WHY LEADING CONTRACTORS SPECIFY Thor

ROCK DRILLS and BREAKERS



The ENGINEER knows that . . .
Thor's Light Weight, Short-Travel Valve Produces More Work—Cuts Operating Costs!

The Valve is to an air tool what the carburetor is to an automobile engine . . . the vital *heart* controlling the inlet of power. So intricate is the valve, however, that only engineers who know its function recognize what benefits it can contribute to an air tool's performance and service life.

Leading engineers everywhere specify Thor Tools because Thor valves provide *faster, better work—at lower operating costs*—through these features:

SPEED . . . *Air Economy.* Extremely light in weight, the Thor Valve moves faster to provide more blows per minute. It maintains this relative high efficiency even at low air line pressures.

POSITIVE ACTION. Light weight, short-travel—and the important fact that the Thor Valve is actuated by the difference between air line pressure and exhaust pressure—assures positive action that *completes every blow.*

ENDLESS LIFE. Light weight and short-travel—plus the *large bearing surface* on which the Thor Valve operates—eliminates breakage . . . reduces wear to a minimum.

NON-FREEZING . . . *Never "Air-starved."* Constant pressure chamber maintains air at constant line temperature and pressure. Air cannot expand until it passes valve . . . thus valve cannot "freeze."

EXACT TIMING and BALANCE. All these valve functions are in perfect-timing and balance with the piston hammer. Every stroke is air-cushioned; every blow is complete and powerful.

Have your engineer check these Thor advantages. He'll agree—your nearby Thor Distributor stocks the tools that will give you *more work . . . at lowest cost!*

INDEPENDENT PNEUMATIC TOOL COMPANY
600 W. Jackson Boulevard, Chicago 6, Illinois
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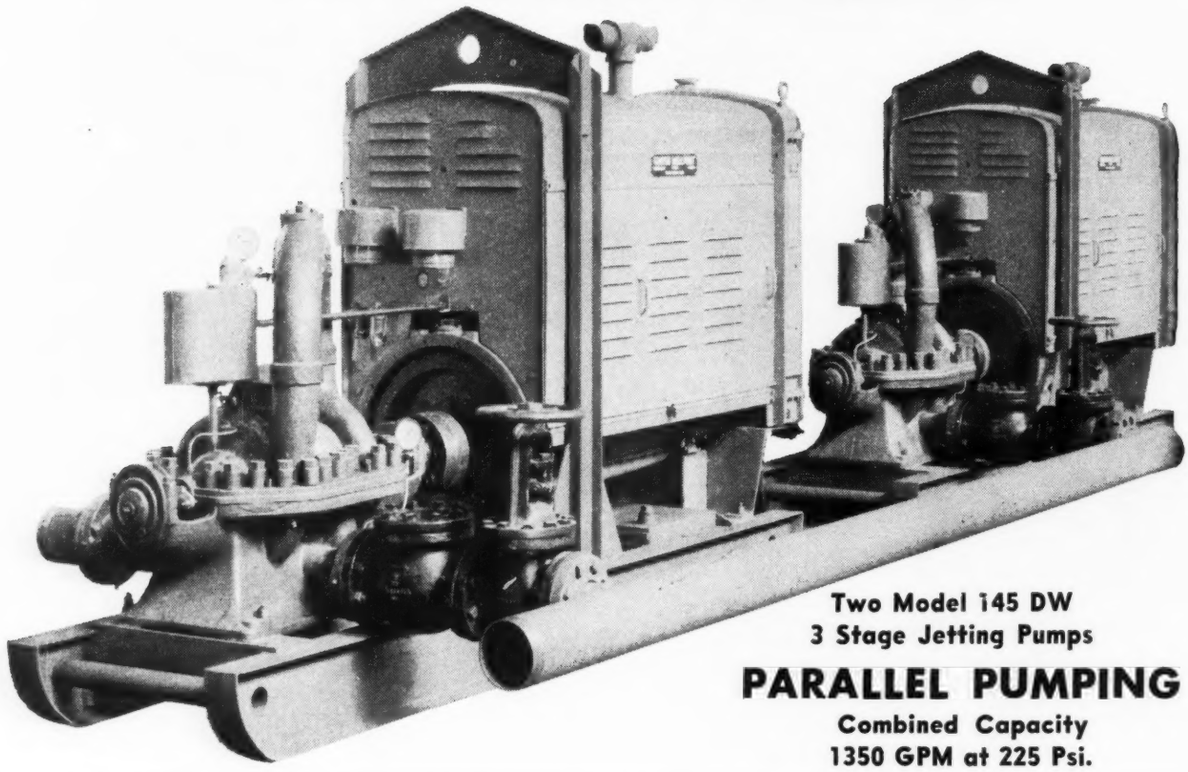
Thor **PORTABLE POWER TOOLS**

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

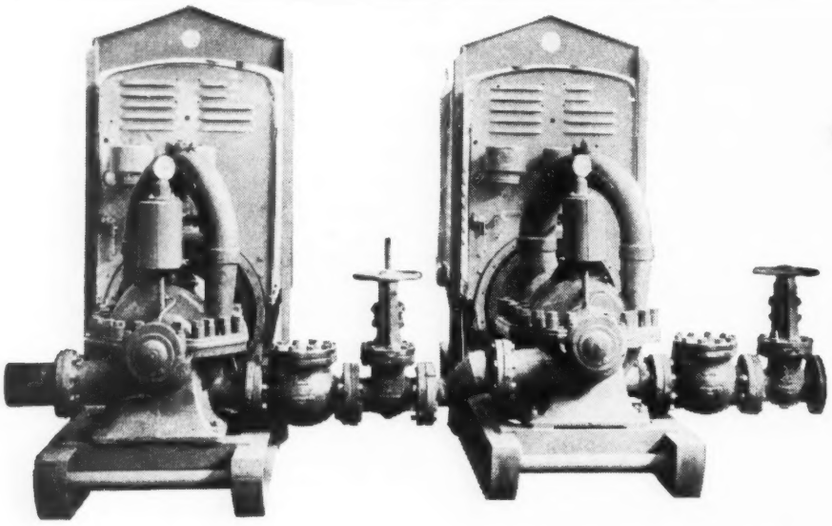
Griffin Jetting Pump Systems
for the "TOUGH JOBS"



Two Model 145 DW
3 Stage Jetting Pumps

PARALLEL PUMPING

Combined Capacity
1350 GPM at 225 Psi.



Two Model 145 DW
3 Stage Jetting Pumps
for

SERIES PUMPING

Combined Capacity
675 GPM at 450 Psi.

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Equipment Leased and Sold

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GRIFFIN ENGINEERING CORP.
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ATKINS "SILVER STEEL" SAWS

to Keep Up With the Pace of New Building

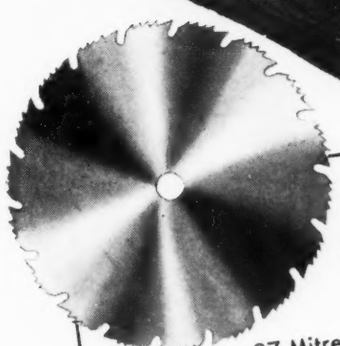
Young but famous number of the Atkins line of "Silver Steel" Hand Saws is the No. 2000 Saw... Rugged, keen to cut and keep cutting.

With the tempo of new construction bound to step up to new highs, you'll want to equip your men with saws that will help you keep up with the new pace. The name to remember then is Atkins "Silver Steel." It's the name that stands for the best in saws — in these practical ways:

Fast cutting, even on tough jobs, because Atkins saws have the design, the balance, the easy handling qualities that take much of the hard work out of sawing.

Keen, tough teeth, that continue to cut fast and easy for surprisingly long periods, with a minimum of filing.

Have these and many other advantages by saying "Atkins Silver Steel" whenever you buy saws.



Atkins Circular Saws

Atkins No. 37 Mitre Tooth Saw shown above is ideal on portable power saws or saw tables. One of a full line of Atkins "Silver Steel" Circular Saws.

E. C. ATKINS AND COMPANY
402 S. Illinois St., Indianapolis 9, Indiana
Agents and Dealers in All Principal Cities the World Over

ATKINS

MANUFACTURERS OF BETTER SAWS FOR EVERY CUTTING JOB

The new Raybestos "KEY-LOK"

(PATENTS PENDING)

Slide-on brake block for big jobs makes replacement quick, simple

■ Now you can replace brake blocks on the big jobs with a simple *turn-of-the-wrench!*

Down-time for relining is cut to the minimum. Just "slide off the old and slip on the new"—with Raybestos "Key-Lok" block. You'll save hours . . . because you don't have to remove troublesome bolts, bands or shoes. You're back on the job in a fraction of the time—*and you get the best brake service you've ever had!*

Save time, labor, money . . . get better braking . . . with "Key-Lok." It's available for all your heavy equipment; it's precision-made for each application. See your Raybestos jobber or write us for prices and details.

There's much more to Raybestos "Key-Lok" than the time you save. Here are other advantages:

1. **It has up to 6½% more friction surface.**
2. **No squeak can be caused by loose blocks.**
3. **Unbroken surface—no bother with plugs.**
4. **No holes to collect foreign abrasive material.**
5. **Brakes relined by simply sliding blocks over shoes.**
6. **Keepers hold blocks to shoe with up to 7 times greater holding power than with bolts.**

Raybestos "Key-Lok" means lower cost of brake block maintenance as well as installation.

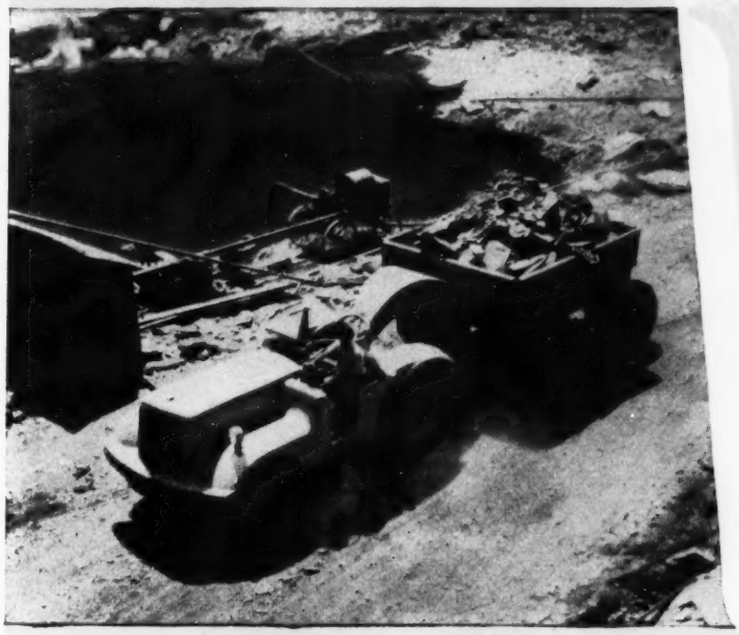
THE RAYBESTOS DIVISION of Raybestos-Manhattan, Inc., BRIDGEPORT, CONNECTICUT

Raybestos

INDUSTRIAL FRICTION MATERIALS

The single source for all four friction materials—Full Metallic, Semi-Metallic, Woven and Molded

Rubber-Tired for *HIGH-SPEED HAULING*



Forged-Trak Wheels for *ADVERSE FOOTING*

All-Job Hauling Units

Athey APCOR Products

HAULING EQUIPMENT to meet job needs—that's the Athey **story** in a nutshell. For long, high-speed hauls, there's the 10 yard, 2-Way Dump Athey PD-10 Rubber-Tired Trailer, built to match the speed and capacity of the DW10 Tractor. For rough going and adverse weather, there's the complete line of rugged Athey Forged-Trak Trailers that keep your toughest jobs going on schedule. It's tracks or rubber with proven Athey products—machines to fit job requirements for lowest costs, biggest profits. Check with your Athey-"Caterpillar" Dealer before you buy *any* hauling equipment—be sure it is custom-selected for your hauling needs. See him today!

ATHEY PRODUCTS CORPORATION, CHICAGO 38, ILL.

Athey

DEPENDABLE LOADING & HAULING EQUIPMENT

War-Proved Power
for Post-War Hauling

Heavy Duty GMCs are "made to order" for all kinds of heavy hauling jobs. On or off the highway, you can count on GMCs to provide peak performance and pulling power.

Patterned after the powerplant used in nearly 600,000 GMC military vehicles, GMC valve-in-head engines have been battle-tested, war-proved and improved. GMC heavy duty engines are famous for such features as Turbo-Top pistons, stellite faced exhaust valve seat inserts, full pressure lubrication, full length water jackets and 7-bearing crankshafts with steel-backed, precision-type bearings.

Ruggedness and stamina are built into every feature of GMC chassis. Heavy duty clutches . . . five-speed, synchro-mesh transmissions . . . power hydraulic or air brakes . . . dual-performance, double reduction or worm drive axles...add super strength to heavy duty GMCs.

Remember, too, every GMC, ½ to 20 tons, is truck-engineered and truck-built by the largest exclusive producer of commercial vehicles.

THE TRUCK OF VALUE **GMC TRUCKS** **GASOLINE • DIESEL**

GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION

FREE!

to contractors and engineers

This new book contains complete data on American Welded Wire Fabric for concrete reinforcement

In this 178-page book you will find information on the most common uses of welded wire fabric reinforcement in all types of concrete construction. For instance: a description of the fabric and its advantages—its uses in general building construction—precast concrete units — reinforced concrete pipe — concrete pavements — airport runways — tables and general information — miscellaneous data.

It tells why millions of square feet of American Welded Wire Fabric Reinforcement have been used in the world's outstanding buildings. There are pictures of the buildings, a group whose names make up the "Social Register" of modern architecture.

THIS superior concrete reinforcement—consisting of closely spaced cold drawn wires of high yield-point steel, prefabricated by electric welding—fortifies the concrete slab against shocks, strain and stresses in all directions. It is easily handled, quickly installed, lies flat and stays in place. Many architects have learned by experience that U·S·S American Welded Wire Fabric Reinforcement is not only eminently efficient, but —since it saves on material cost and construction time—unusually economical.

In the record of wire fabric reinforcement you may well find the basic ideas for many new—as yet unheard of—uses for reinforced concrete. Meanwhile, you can have at hand "American Welded Wire Fabric for Concrete Reinforcement", a work-a-day helper in planning all sorts of reinforced concrete jobs. Send in the convenient coupon today and your free copy will be forwarded promptly.

EVERY SUNDAY EVENING, United States Steel presents *The Theatre Guild on the Air*. American Broadcasting Company coast-to-coast network. Consult your newspaper for time and station.

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AMERICAN STEEL & WIRE COMPANY
USS
AMERICAN WELDED WIRE FABRIC
UNITED STATES STEEL

SEND NO MONEY! IT'S FREE!

American Steel & Wire Company
408 Rockefeller Building
Cleveland, Ohio

Gentlemen:

Please forward my free copy of "American Welded Wire Fabric For Concrete Reinforcement".

Name..... Occupation.....

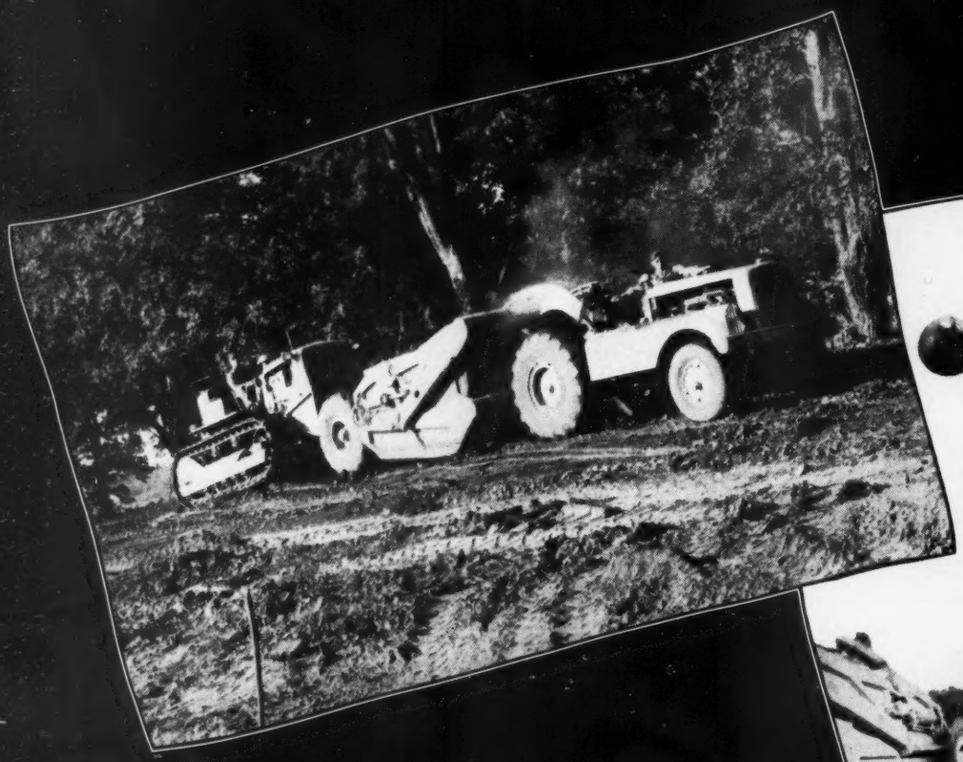
Address.....

City..... State.....

U·S·S American WELDED WIRE FABRIC

"CATERPILLAR"

Stand out



CATERPILLAR

REG. U.S. PAT. OFF.

DIESELS
because they Stand up

WHEN a competitor says "Those 'Caterpillar' folks are quality crazy," it is taken as a real compliment. Because quality in all products is the first thing "Caterpillar" research engineers, designers, metallurgists and manufacturing heads think about. . . .

Quality that means dependable performance—no costly interruptions, no long or frequent down time. Quality that gives owners low fuel and other operating costs. Quality that assures low maintenance costs. Quality that reduces repair expense and parts replacements to the minimum. Quality that enables "Caterpillar" equipment to *stand up*—to lick the tough jobs, run many thousands of hours, assist the contractor to do good work at a substantial saving to his customers and at an attractive profit to himself.

What is a typical tough job? Levee building, for one. Working in heavy, sticky Mississippi River gumbo in particular. On the project spot-illustrated here. Luhr Bros. Construction used a fleet of scraper-operating "Caterpillar" Diesel Tractors of both track and wheel types. "Zoning" the equipment to fit the hauls and other needs speeded the work, cut the cost and made more money.

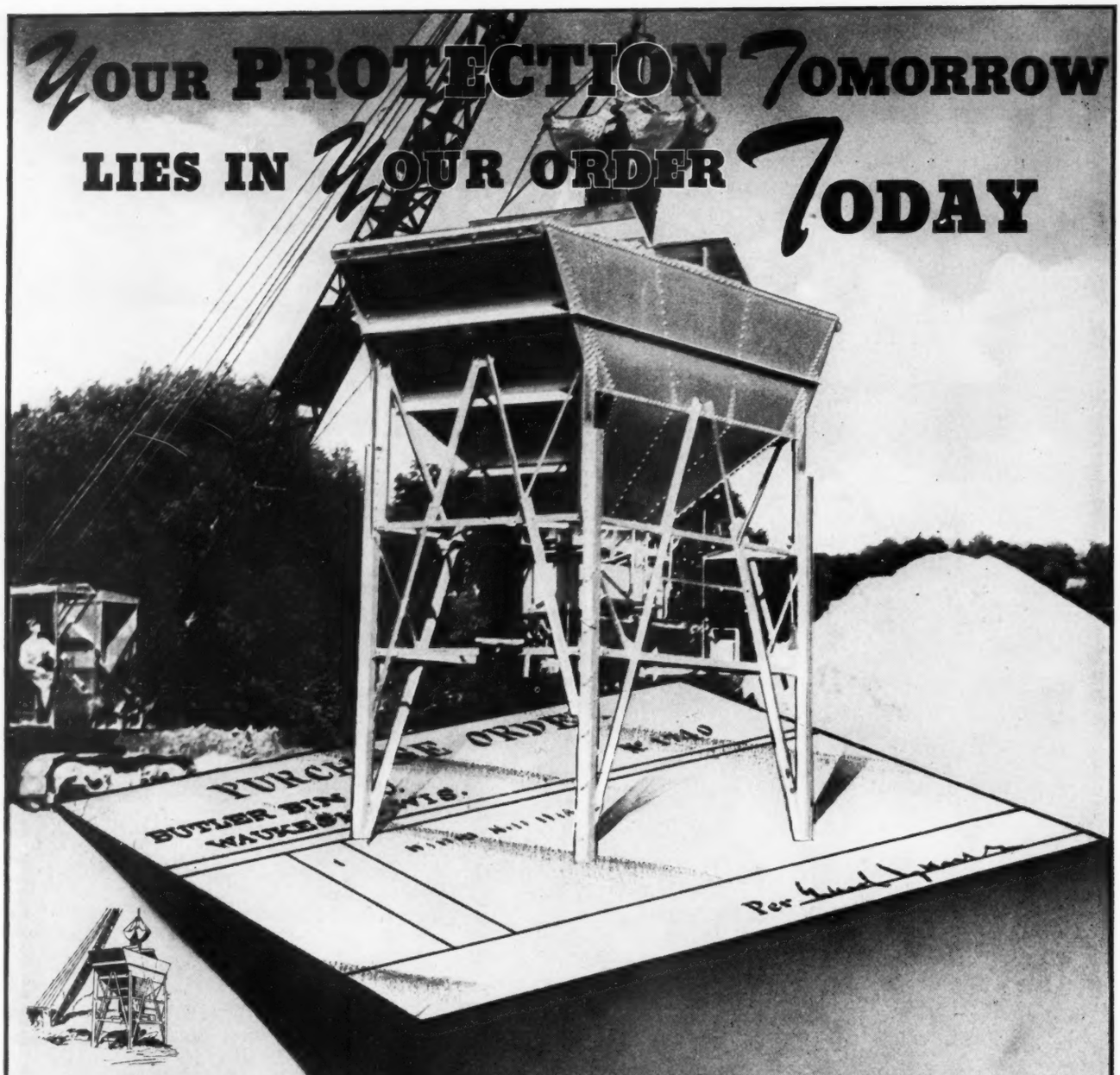
Floodlighting, for double-shift operation, with a portable "Caterpillar" Diesel Electric Set helped further to shorten the completion time, reduced overhead and enabled earlier release of equipment for the next job.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

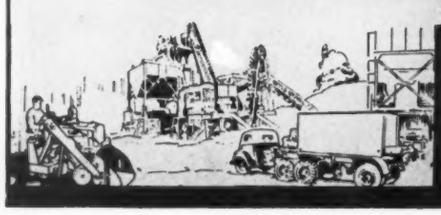
THE DISCHARGED VETERAN WEARS THIS EMBLEM. REMEMBER HIS SERVICE AND HONOR HIM.

YOUR PROTECTION TOMORROW LIES IN YOUR ORDER TODAY

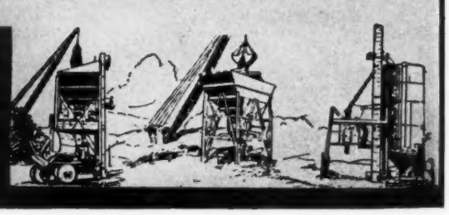


Stop and analyze now, — today, — your future equipment requirements. Analyze in the light of two imperative factors. First, — highway reconstruction alone, to say nothing of the vast new highway programs, involve an equipment demand that will require as much effort on the part of manufacturers as ever did the demands of war. Second, — time schedules, competition and the magnitude of the task will require equipment engineered to the utmost in capacities and production.

For these reasons, sound, far sighted policy dictates that, — to be assured that the most modern equipment (the finest in high production Engineered Design will be on your jobs when you want them) — your order should be placed now for future delivery — and, of course, placed with Butler.



BUTLER
BIN COMPANY
WAUKESHA, WISCONSIN



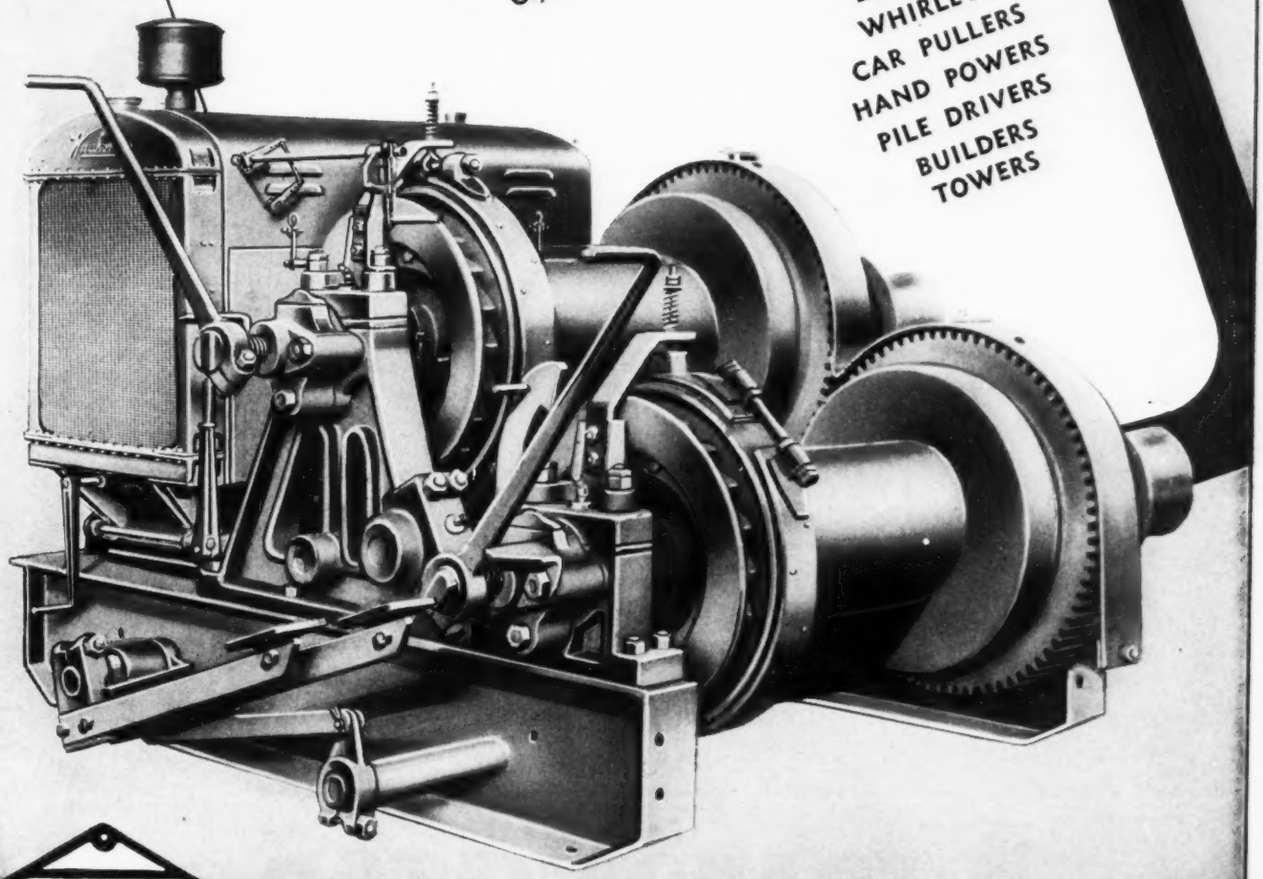
TOP PERFORMANCE
with Clyde Gasoline Hoists

There is no substitute for performance in a hoist . . . performance that keeps materials and supplies moving week after week; month after month without delay.

Clyde Gasoline Hoists mean top performance . . . a reputation established by thousands of job tested machines. Clyde hoists are scientifically engineered and carefully constructed to give you the most dollar-for-dollar value. Excessive weight has been eliminated with no sacrifice of strength . . . their practical design provides economy, efficiency and ease of operation.

Put a Clyde to work on your next job. Write for special, informative bulletins on any Clyde Quality Product:—

HOISTS
DERRICKS
WHIRLEYS
CAR PULLERS
HAND POWERS
PILE DRIVERS
BUILDERS
TOWERS



CLYDE

CLYDE IRON WORKS, Inc.

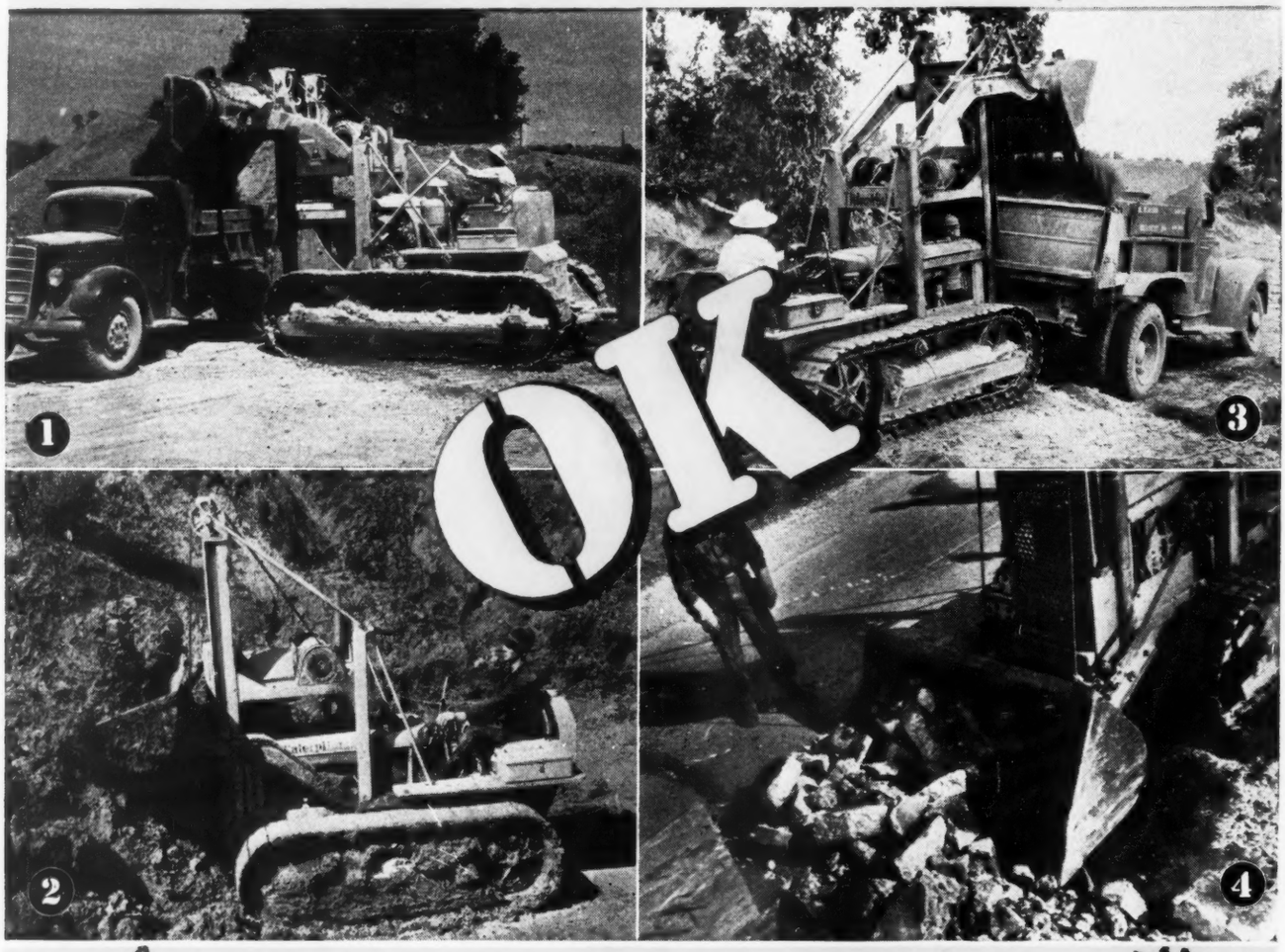
Duluth 1, Minnesota

You're OK for Performance and Profits when you TRAXCAVATE!

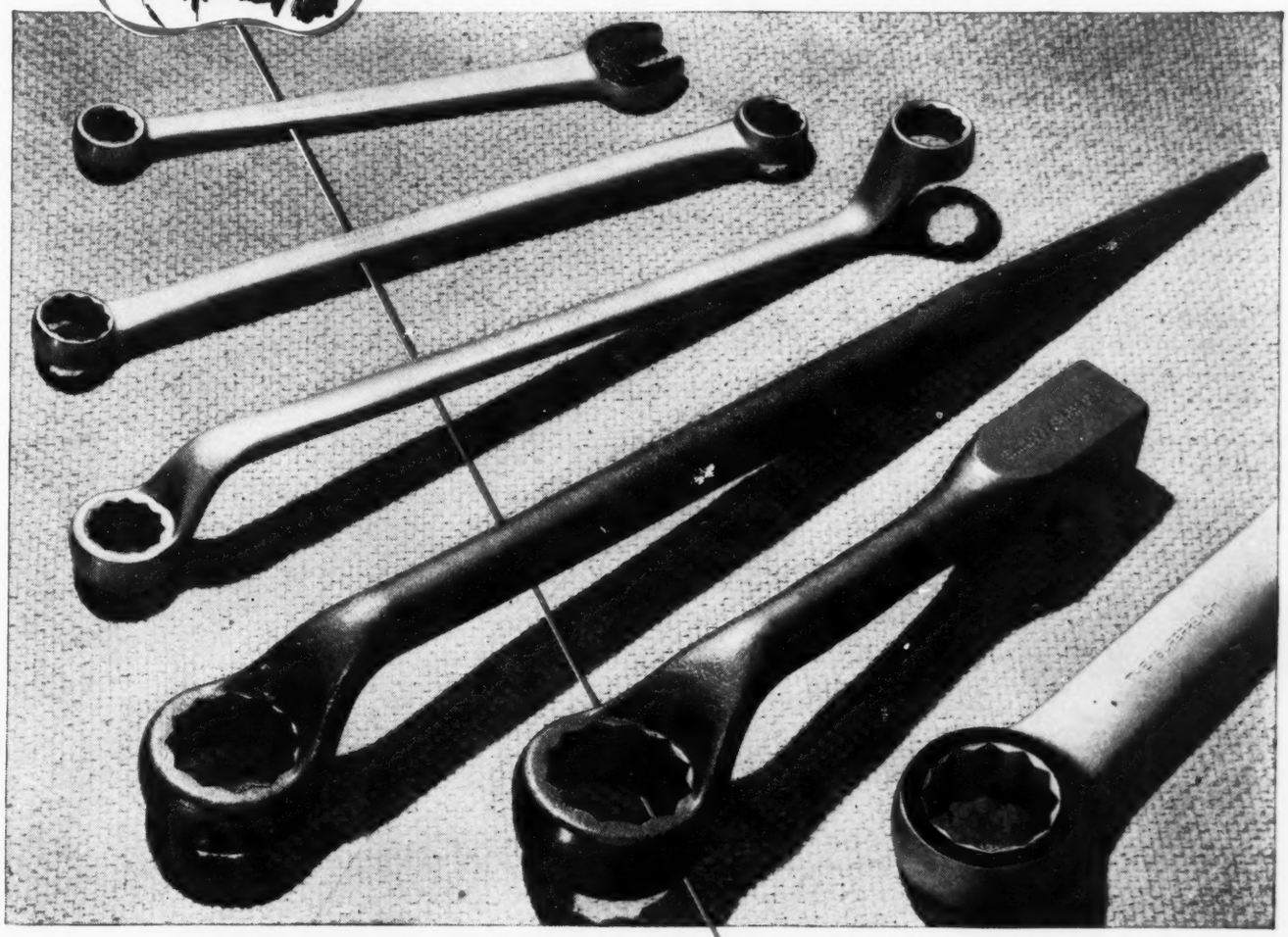
IF you like to match performance records with cost records, you'll put your stamp of approval on TRAXCAVATORS. These rugged earth-moving and material-handling machines dig, load, carry, grade, and do so many other essential tasks, they can be kept busy more hours on more jobs. TRAXCAVATORS' versatility pays big dividends in top performance at low cost all year around.

TRAXCAVATORS are built in sizes for every job and purpose, with bucket capacities from ½ to 2½ cubic yards. Bulldozer blade and other handy attachments are also available to further the usefulness of these machines. Your TRACKSON-"Caterpillar" dealer will gladly show you why it pays to TRAXCAVATE! See him today, or write for the details to TRACKSON COMPANY, Dept. CM-36, Milwaukee 1, Wisconsin.

1. Model T7 TRAXCAVATOR excavating for a new plant in California
2. Model T2 cleaning a landslide from a highway
3. A Missouri township's T2 loads sand for 1½ miles of road a day
4. Model T4 taking up and loading old highway concrete



More OPMH*



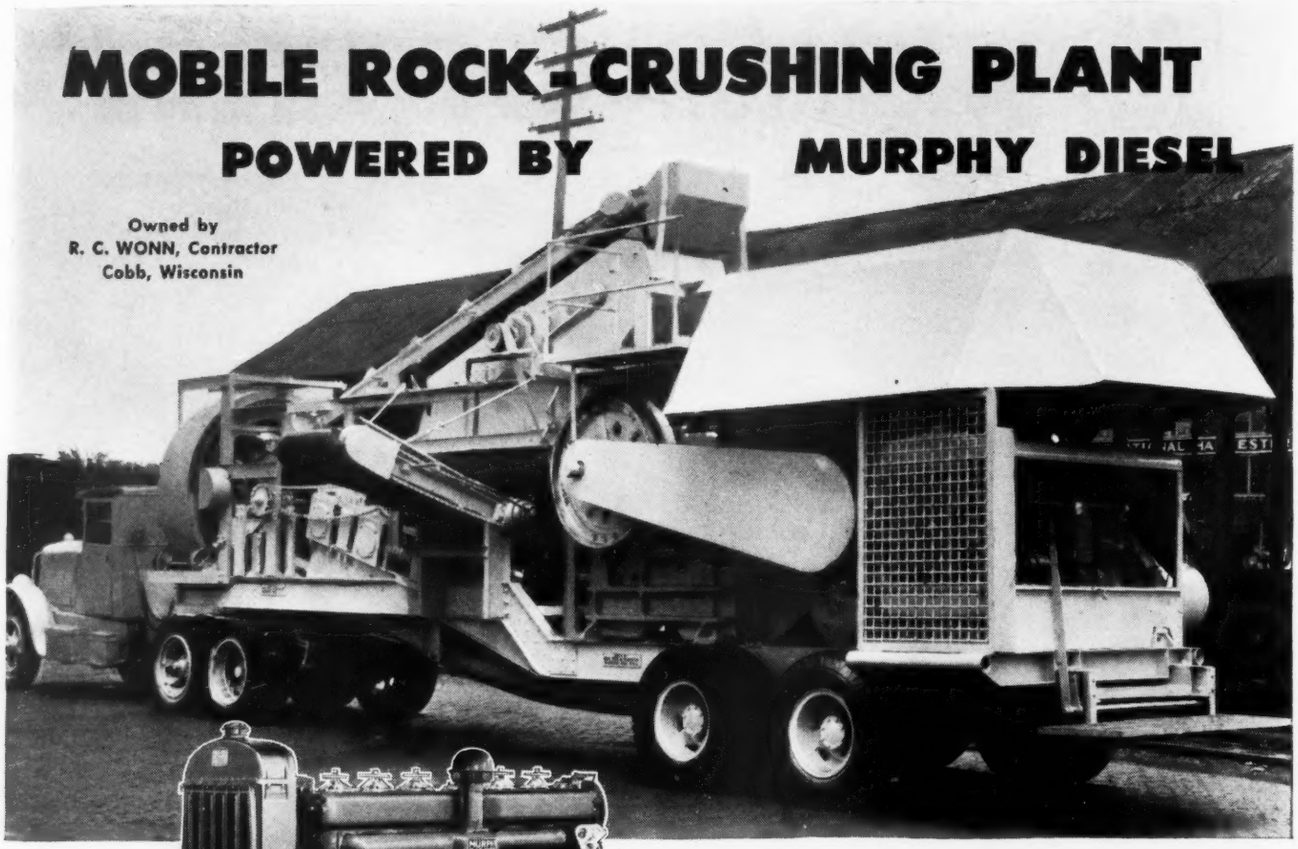
Williams Box "Superrenches", with their thin head walls, permit fast and safe operation where clearances are limited. Offset handles clear obstructions that would otherwise bark knuckles and generally slow up the work. Their 12-point openings grip hex nuts on six sides...preventing slippage and rounding of the nut's corners. Complete rotation of hex nuts is possible with these wrenches where handle swing is limited to as little as 30° . . . less than one-tenth of a full turn. Yes sir, these wrenches do guarantee more **output per man-hour!*

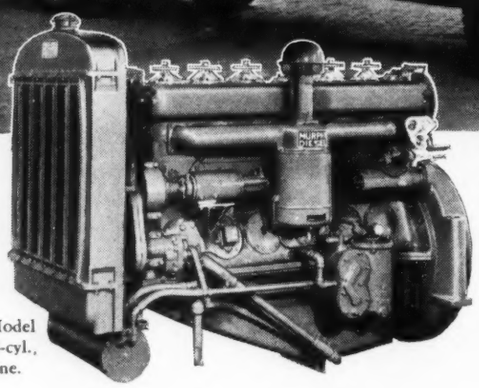
Williams Box "Superrenches" are made in a variety of popular patterns, including Structural and Striking face types. All are forged from tough alloy steel, heat-treated and fully guaranteed. Sold by Industrial Distributors everywhere.
J. H. WILLIAMS & CO., BUFFALO 7, N. Y.

WILLIAMS
DROP-FORGINGS AND DROP-FORGED TOOLS

MOBILE ROCK-CRUSHING PLANT
POWERED BY MURPHY DIESEL

Owned by
R. C. WONN, Contractor
Cobb, Wisconsin





Murphy Diesel Model ME-66, 6 x 6½, 6-cyl., full Diesel engine.

WANT *to* CRUSH *More Rock?*

GET A ROCK-CRUSHING PLANT *powered by* MURPHY DIESEL

THERE'S one outstanding reason why you should make it a point to see that your rock-crushing plant is powered by MURPHY DIESEL. The reason is simply this: You'll get more rock at less cost! It's the reason why MURPHY DIESEL engines have become so popular in the rock-crushing field . . . and there are other sound reasons, too, for the success of MURPHY DIESELS on all types of heavy-duty jobs in the construction industry: Dependability, ruggedness, economy of operation and maintenance, compactness, portability, easy starting in any weather . . . all reasons that add up to MORE POWER, MORE PROFIT. Write for bulletin.

FIELD-PROVEN *Power* . .

More Power
MURPHY DIESEL
More Profit

117

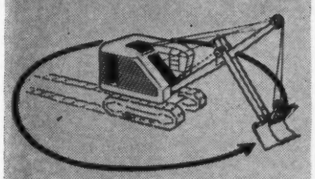
MURPHY DIESEL COMPANY

Engines from 90 to 215 H.P. Generator Sets from 60 to 115 K.W.

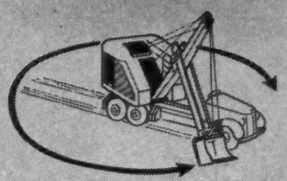
5339 W. BURNHAM STREET . . . . . MILWAUKEE 14, WISCONSIN

BEFORE

You could have a full circle shovel on CRAWLERS...



or, a part circle shovel with rubber tire MOBILITY...



NOW

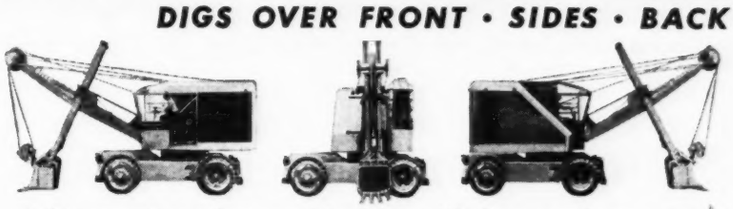
You can have a full circle shovel with rubber tire mobility... and one man operation

Profit WITH THESE OUTSTANDING FEATURES:

1. **SELF PROPELLED** ... around the job or on the highway.
   Eliminates Trailer
2. **ONE MAN OPERATED** ... All controls conveniently grouped for operating or steering by the one operator.
   Eliminates Second Man
3. **4-WHEEL DRIVE** ... 6 wheel traction, mud grip tires.
   Specially Engineered Chassis
4. **DIGS ALL AROUND** ... Over front, sides, back.
   A Full Circle Machine
5. **AIR CONTROLS, AIR BRAKES** ... Power steer.
   Not An "Old" Design Modernized
6. **NEW SMOOTH, "AIRFLEX" COOL INTERNAL EXPANDING CLUTCHES.**
   Free From Adjustment and Repair
7. **ENCLOSED GEARS RUNNING IN FLOWING OIL.**
   Efficient, Clean, Longlived
8. **CONVERTIBLE TO ALL ATTACHMENTS.**
   7½ Ton Safe Crane Lifting Capacity

ENTIRELY ONE-MAN OPERATED FOR DIGGING OR TRAVELING—NO EXTRA DRIVER
SHORT COUPLED, BIG RUBBER SELF-PROPELLED, 4-WHEEL DRIVE CHASSIS ALWAYS READY TO TRAVEL ON HIGHWAYS
DIGS ON ALL FOUR SIDES LIKE A CONVENTIONAL FULL CIRCLE CRAWLER SHOVEL

DIGS OVER FRONT • SIDES • BACK



This complete illustrated booklet will show you how Byers Traveler meets today's power shovel requirements

THE BYERS MACHINE COMPANY • RAVENNA, OHIO
Distributors throughout the world

Your local Byers Distributor will gladly give you full information or complete catalog on Byers half yard Traveler

BYERS HALF YARD TRAVELER

In the Spotlight!

Outstanding performance always wins recognition and acceptance... In the field of Wire Rope, "HERCULES" (Red-Strand) long ago won its place "In The Spotlight" because of its uniform reliability and economy in every industry that calls for "heavy duty" action.

You won't go wrong when you adopt the Red-Strand as your buying guide for wire rope. As "HERCULES" is furnished in both Round Strand and Flattened Strand construction, and in either the Preformed or Non-Preformed type—you are assured of adaptability as well as of high quality.

Ask our Engineering Department to recommend the type and construction best suited to your needs.

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS — ESTABLISHED 1857

5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.

NEW YORK . . . 90 West Street
CHICAGO . . 810 W. Washington Blvd.
DENVER . . . 1554 Wazee Street

SAN FRANCISCO . . 520 Fourth Street
PORTLAND . . 914 N. W. 14th Avenue
SEATTLE . . 3410 First Avenue South

3-4 TON TANDEM
Powered with
Air Cooled Engine

HUBER *Announces*
TWO NEW ROLLERS

5-8 TON TANDEM
with
Fluid Coupling

You'll want to know more about these two new Huber developments. Write direct or to your nearest Huber Distributor.

THE HUBER MFG. COMPANY • MARION, OHIO, U. S. A.

HUBER ROLLERS

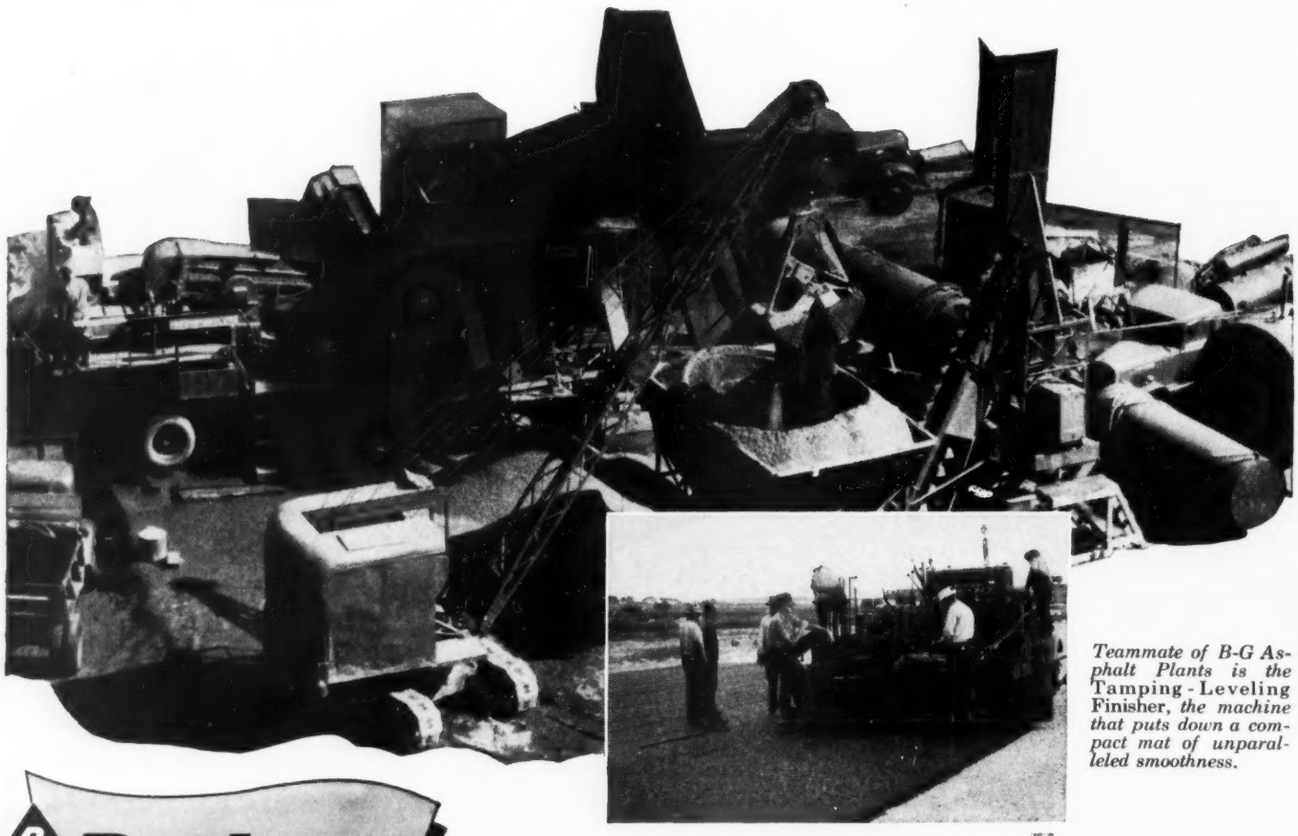
3 WHEEL and TANDEM • all sizes • GAS or DIESEL

How a B-G *Central Plant* Provides Positive Control of Aggregate Gradation

• There is positive gradation control of aggregate in a Barber-Greene Central Plant when the Gradation Control Unit is used. The aggregate is accurately sized *after* the drying operation, and there is no manual weighing or processing required.

A continuous flow of material in a relatively small stream from stock pile to finished mix in the trucks removes any problem of segregation. Locked calibrated gates maintain a uniform flow of aggregate. The aggregate feeder is interlocked with the bitumen pump, keeping the proportion well within the most rigid specification requirement.

These Central Plants are low in cost, quickly set up or moved, and can produce any type of mix required. Write for illustrated catalog, explaining the continuous mixing principle exclusive with the Barber-Greene line. Barber-Greene Company, Aurora, Illinois.



Teammate of B-G Asphalt Plants is the Tamping-Leveling Finisher, *the machine that puts down a compact mat of unparalleled smoothness.*

45-9

B-G Barber-Greene CONSTANT FLOW EQUIPMENT

LOADERS • PERMANENT CONVEYORS • DITCHERS • PORTABLE CONVEYORS • FINISHERS • BITUMINOUS PLANTS • COAL MACHINES

LIMA QUALITY PAYS OFF Again

TWICE SABOTAGED GIANT LIMA CRANE AGAIN ON DUTY AT SHIP REPAIR YARD

Much of the heavy duty "lifting" at the Industrial Department Ship Repair yard is accomplished with a crane which has been sabotaged twice—first by American civilians and then by the Japs.

This lumbering Type 1201 Lima crane, built by the Lima Locomotive Works, Incorporated long before World War II, is a familiar sight at the yard. The slow moving giant with its 80 foot boom and its lifting capacity of 45 tons, lifts a five inch gun mount or a battleship's propellor with ease.

Before the war, the crane was operated by civilian contractors on Island building projects. When the Japs invaded Guam in 1942, the civilians dynamited the crane, saturated it with gasoline and set it afire to prevent it from falling into the hands of the enemy as a usable piece of equipment. The wreckage was abandoned by the Americans as being totally useless.

When the Japanese took over, they probed into what remained of the crane and endeavored to rebuild it, but their efforts were unsuccessful. The Japs were still trying to rebuild the crane when the Yanks returned to Guam.

With the advent of the Americans, the Japs attempted to sabotage what little they had accomplished towards rebuilding the giant machine. They moved it under a precipice and blew up the side of the cliff in a frantic move to conceal the crane from the invaders and to prevent them from ever using it again.

The Seabees however, dug it out of the dirt, rebuilt it successfully and arranged for its transportation from the Seabee repair unit where it was rebuilt to Sumay.

The 95 Ton mass of steel was painstakingly loaded onto a 927th Army Engineers 60 ton low trailer, powered by two six ton White Army trucks.

The 25 mile trip was covered at a maximum speed of 7 miles an hour and the strange contingent was forced to halt every mile and a half to allow the tires to cool. Eleven men and 20 hours of continuous work were required to haul the twice sabotaged giant to its destination.

reprinted from
Navy News—Guam, Marianas Islands
Monday, December 17, 1945 issue

We do not mean to infer that LIMA shovels, cranes and draglines are indestructible. They are however, built strong and rugged to withstand the severe shocks and stresses encountered in hard digging. Added to heavy-duty construction, LIMA offers modern design with time tested features which lower operating costs, provide maximum efficiency and increase output. The next time you need a quality shovel, crane or dragline, investigate LIMA—the machine that can "take it." It is identified by the Diamond on the cab—for 75 years an emblem of quality workmanship. *The illustration above shows a Type 1201, similar to the one referred to in the Navy News.*

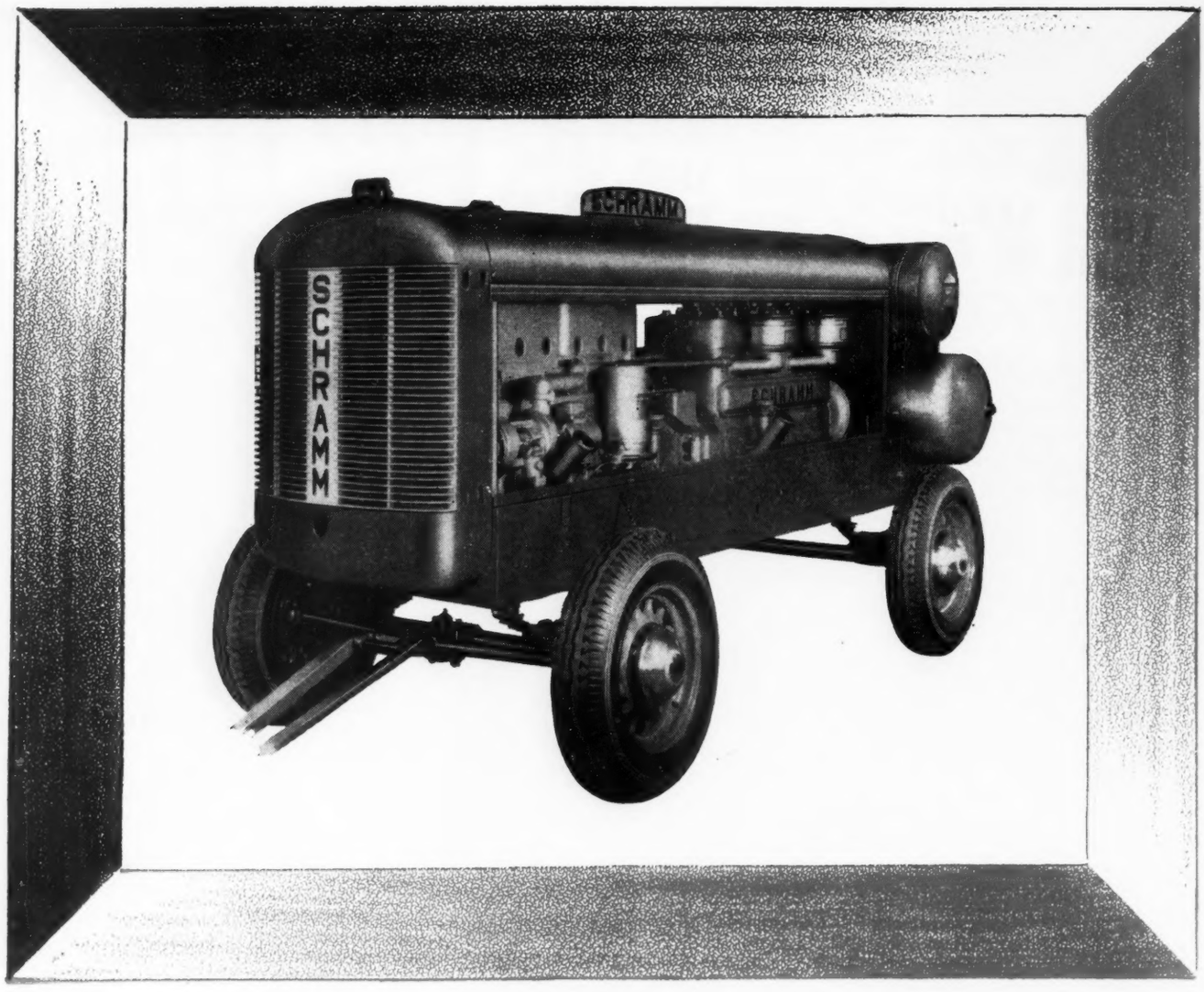
LIMA LOCOMOTIVE WORKS, INCORPORATED
Shovel and Crane Division — LIMA, OHIO, U. S. A.

NEW YORK, N. Y. · DALLAS, TEXAS · SAN FRANCISCO, CALIF. · MEMPHIS, TENN. · SEATTLE, WASH. · NEWARK, N. J. · PORTLAND, ORE. · LOS ANGELES, CALIF. · VANCOUVER, B. C. · ST. LOUIS, MO. · MINNEAPOLIS, MINN. · SPOKANE, WASH.

LIMA

SHOVELS ¾ yd. to 5 yds. · DRAGLINES VARIABLE · CRANES 13 Tons to 100 Tons

LIMA



IN AIR COMPRESSORS THERE ARE MASTERPIECES TOO!

The superior features of Schramm Air Compressors put them in the "masterpiece" class. For that reason, behind compressed air jobs, there's usually a Schramm Compressor.

Schramm Air Compressors have these important features: (1) 100% watercooled; (2) Mechanical Intake Valve; (3) Forced Feed Lubrication; (4) Push-button electric starter.

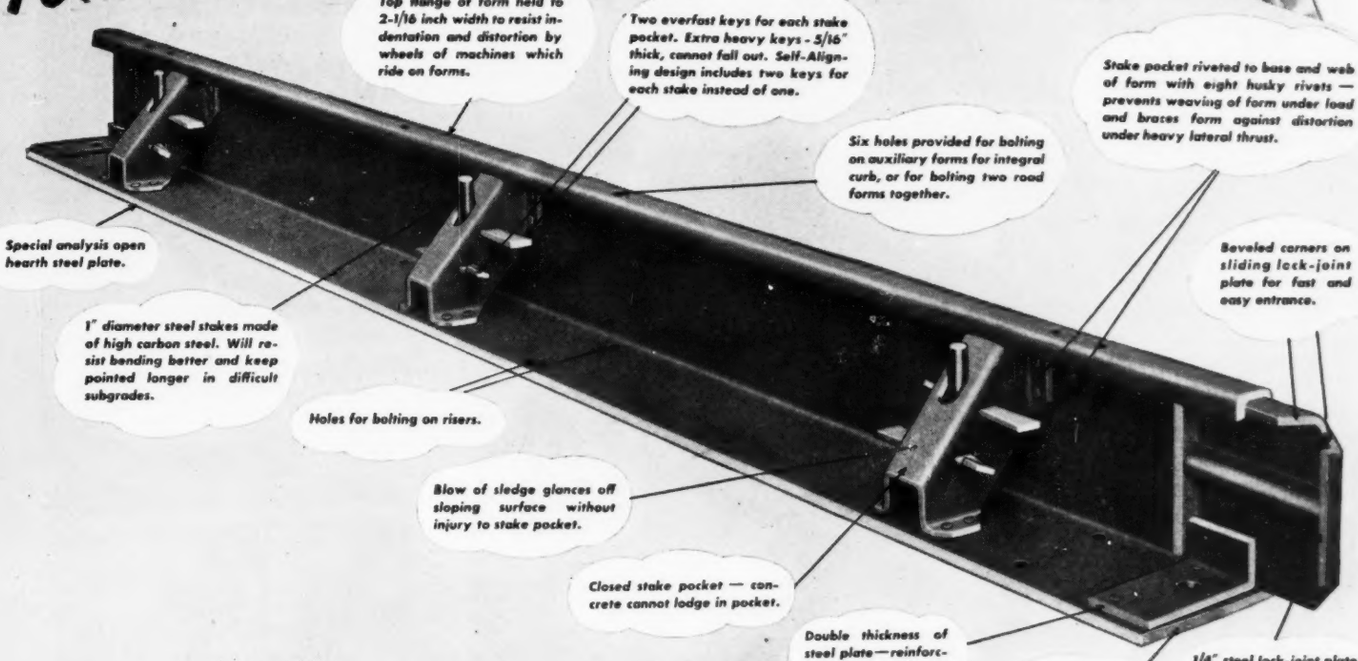
Schramm Compressors are designed for heavy duty, continuous service, with minimum attention. And, whether they are portable or stationary, they are lightweight and compact, and vibrationless!

No wonder they give "masterpiece" performance! And no wonder you will want a Schramm as your next Air Compressor! Make your next compressed air job a "masterpiece" by using Schramm. Write today for full details and data outlined in our new catalog.

SCHRAMM INC.

THE COMPRESSOR PEOPLE
WEST CHESTER
PENNSYLVANIA

Expect and get BLUE RIBBON PERFORMANCE From Improved PAVING FORMS


Top flange of form held to 2-1/16 inch width to resist indentation and distortion by wheels of machines which ride on forms.
Two everfast keys for each stake pocket. Extra heavy keys - 5/16" thick, cannot fall out. Self-Aligning design includes two keys for each stake instead of one.
Stake pocket riveted to base and web of form with eight husky rivets — prevents weaving of form under load and braces form against distortion under heavy lateral thrust.
Six holes provided for bolting on auxiliary forms for integral curb, or for bolting two road forms together.
Special analysis open hearth steel plate.
Beveled corners on sliding lock-joint plate for fast and easy entrance.
1" diameter steel stakes made of high carbon steel. Will resist bending better and keep pointed longer in difficult subgrades.
Holes for bolting on risers.
Blow of sledge glances off sloping surface without injury to stake pocket.
Closed stake pocket — concrete cannot lodge in pocket.
Double thickness of steel plate—reinforcing both ends of form.
Beveled to negotiate inside of curves.
1/4" steel lock-joint plate — made of special steel —reinforced by integral pressed rib.

THE MAKINGS

of more than
00,000 feet of Blaw-Knox paving forms which went to War.

rt of a stock pile of steel plates in the Blaw-Knox yards during the war period.

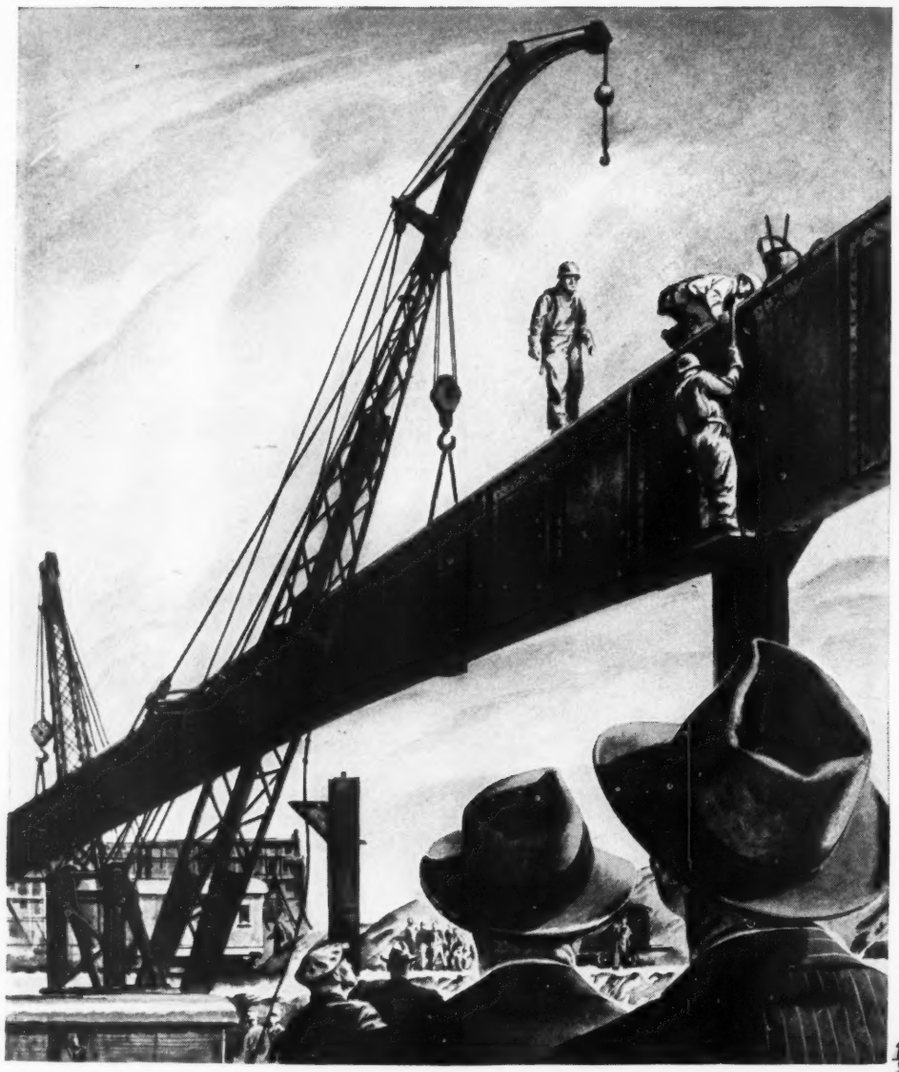
The choice of men who do high speed concrete paving of roads and airports, who appreciate the blue ribbon performance they get from the improved Blaw-Knox Self-Aligning Paving Form.

- It's the only self-aligning paving form on the market, and can be set faster and more accurately.
- Form alignment is undisturbed when stakes bend or if the stake hits an obstruction.
- Less experienced form setters can be used.
- Improved reinforcement for rigidity and durability. Husky rivets and no countersinking of holes in form plate.
- Available in 5 gage (7/32") or 1/4" special analysis open hearth steel plate.

Study the features of Blaw-Knox Paving Forms — learn more about them in Bulletin No. 2037 (we'll send you a copy) — know all the desirable factors that insure faster, better and cheaper form setting on your paving job.

BLAW-KNOX
CONSTRUCTION EQUIPMENT

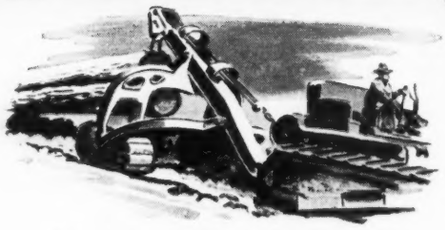
BLAW-KNOX DIVISION OF BLAW-KNOX CO., 2086 Farmers Bank Bldg., Pittsburgh, Pa. • New York • Chicago • Philadelphia • Birmingham • Washington



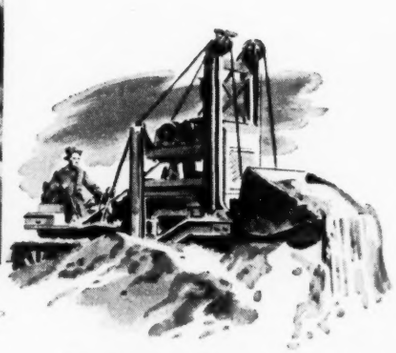
If you're a "Sidewalk Superintendent"

-watch the wire rope

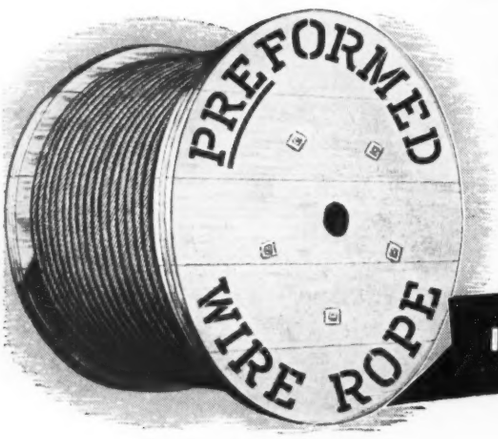
Here's a show that scores a hit wherever it plays—building erection. These big cranes pick up steel girders and mesh them into place like the gears in your car. The star in the cab does it with levers and Preformed wire rope.



Logging machinery moves dead-weight logs with wire rope providing the sinews. Preformed wire rope gets top billing because it handles easier, resists kinking and stands the gaff.



Earth moving has come a long way since the day of the pick, shovel and wheelbarrow. Now bulldozers, shovels and trench hoes make the dirt fly—and their moving parts are actuated by wire rope, Preformed preferred.



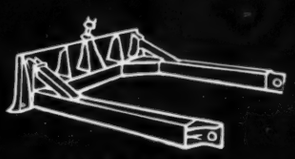
On jobs like these and hundreds of others the new wire rope —Preformed—is breaking old performance records. Operators like it because it's safer and handles easier. The office likes it because it lasts longer and reduces time lost for replacement. It makes money by saving money.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

IT HANDLES EASIER—LASTS LONGER

Details That Mean
DEPENDABILITY!

Operators aren't afraid to put their Buckeye Dozers and Trailbuilders to any test, because they know they'll take the toughest jobs in stride. This dependability adds up to more profit per contract through faster, smoother operation, lower maintenance costs, and more productive time on the job through less time out for adjustment and repair.



MOLDBOARD DESIGN

THESE DETAILS ASSURE *DEPENDABILITY:*

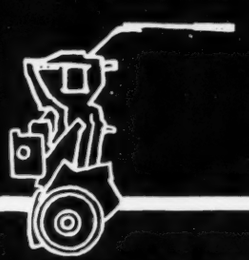
MOLDBOARD DESIGN — Rugged Buckeye Moldboard is structurally braced vertically and horizontally for extra strength with minimum weight. It will take all the stress a tractor can impose, either straight or at an angle.

BALANCED

BALANCED—Buckeye's balanced weight distribution keeps full length of crawlers on ground while working—assures maximum traction—minimizes slipping.

OVERHEAD CABLE SYSTEM

OVERHEAD CABLE SYSTEM—Buckeye's overhead cable system provides fast, smooth operation. Large sheaves, minimum cable turns assure long cable life, negligible power loss.



POWER CONTROL UNIT

POWER CONTROL UNIT—Brakes and clutches are so built that they must take hold of the load smoothly, without jerking, eliminating impact strains, and permitting the economy of smaller cable with efficiency and long life. Efficient application of power is assured.

BUCKEYE TRACTION DITCHER COMPANY
FINDLAY, OHIO

Another cost-cutting Buckeye! The ½ and ¾ yard Buckeye Clipper Convertible Power Shovels. Send for your copy of "Age of the Clippers" today.

built by **Buckeye**

CONVERTIBLE SHOVELS—BULLDOZERS—ROAD WIDENERS
TRENCHERS—MATERIAL SPREADERS—R-B FINEGRADERS

Train Smoke Spelled TROUBLE for the Alton & Southern

The locomotive house beams you see in the photograph above are brand-new replacements of Alcoa Aluminum—another case where the corrosion resistance of Alcoa Aluminum solves a construction problem . . .

For it took only twelve years for corrosive engine smoke to damage the previous steel beams to a point where they demanded replacement. Alton & Southern decided to replace with structural members that would *last* under the severe conditions imposed by heat, moisture, and sulfur gases.

Corrosion resistance is only one of the advantages of Alcoa Aluminum for heavy construction. Members are light in weight, easier to handle. Easy to fabricate. Strong, with all the strength that Alcoa Research has built into the big family of Alcoa Aluminum Alloys.

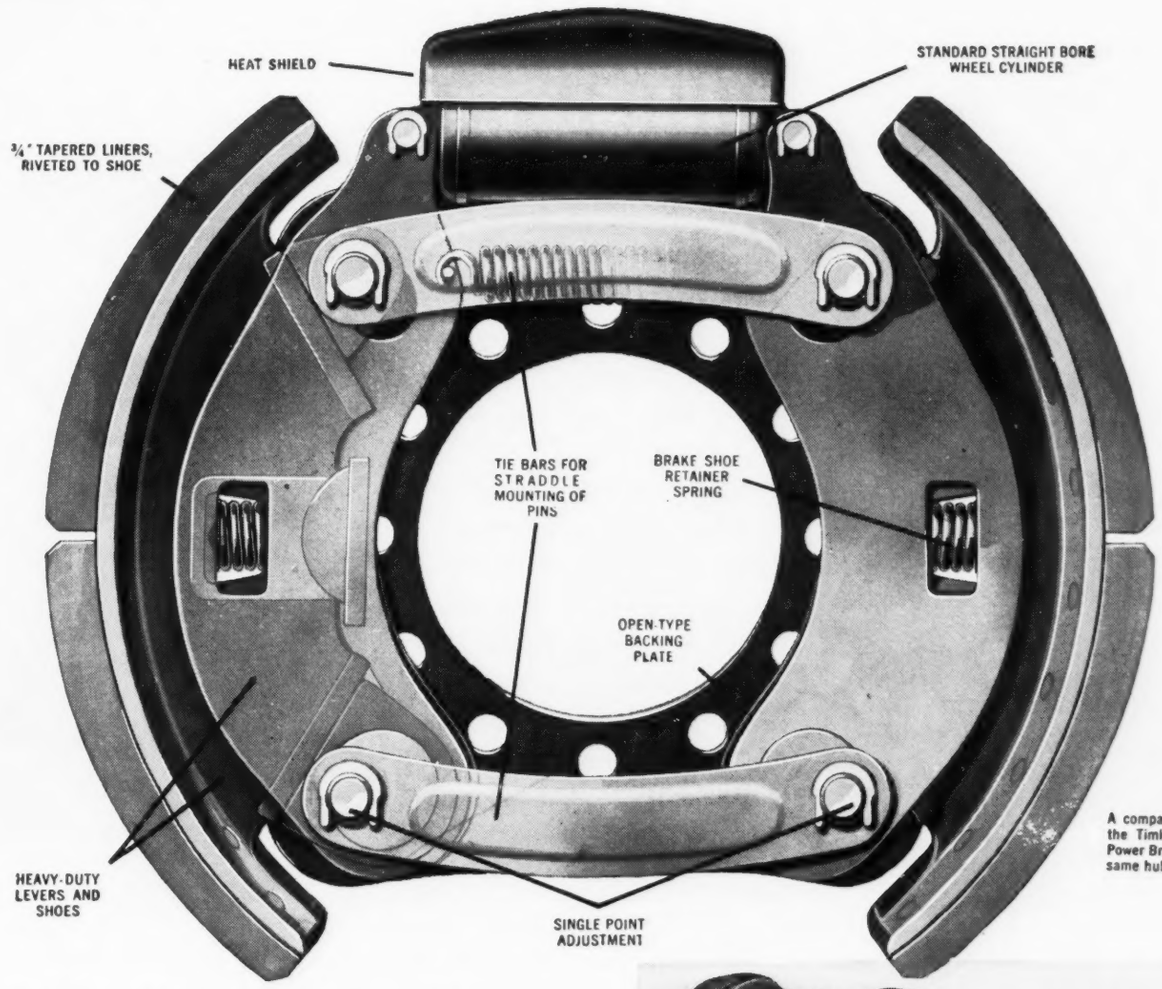
Stock structural shapes are available from your nearby Alcoa distributor. Consult our nearest sales office, or write:

ALUMINUM COMPANY OF AMERICA, 1865 Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA FIRST IN **ALUMINUM**

ALCOA ALUMINUM

The only TRUE HEAVY-DUTY Hydraulic Brake*


HEAT SHIELD
STANDARD STRAIGHT BORE WHEEL CYLINDER
¾" TAPERED LINERS, RIVETED TO SHOE
TIE BARS FOR STRADDLE MOUNTING OF PINS
BRAKE SHOE RETAINER SPRING
OPEN-TYPE BACKING PLATE
HEAVY-DUTY LEVERS AND SHOES
SINGLE POINT ADJUSTMENT

A companion brake to the Timken P Series Power Brake—uses the same hubs and drums.

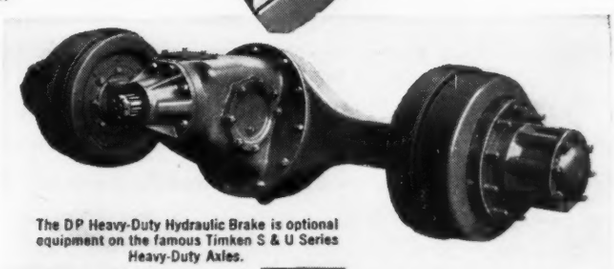
* The New Timken DP Heavy-Duty Hydraulic Brake

The new Timken DP "Dual Primary" Heavy-Duty Brake is the only *true heavy-duty* hydraulic brake made today because:

1. **It has big ¾" tapered liners for even wear and longer life in heavy-duty service.**
2. **It has open-type construction for maximum circulation of cooling air, giving increased braking efficiency with decreased fading.**

It incorporates all the advanced features which have made the Timken DP Hydraulic Brake outstanding in the medium-duty field. For example: *Both shoes are forward-acting* in both forward or reverse. Braking effect is increased as much as 35% at all accepted hydraulic line pressures. There is only *one point of adjustment* per shoe—and it is easily accessible. *Shoes are easily and quickly removable* for relining by simply removing the retainer spring. Hydraulic cylinder and anchor pins remain undisturbed.

Specify this new DP "Dual Primary" Brake for heavy-duty service. Write for free folder today.



The DP Heavy-Duty Hydraulic Brake is optional equipment on the famous Timken S & U Series Heavy-Duty Axles.

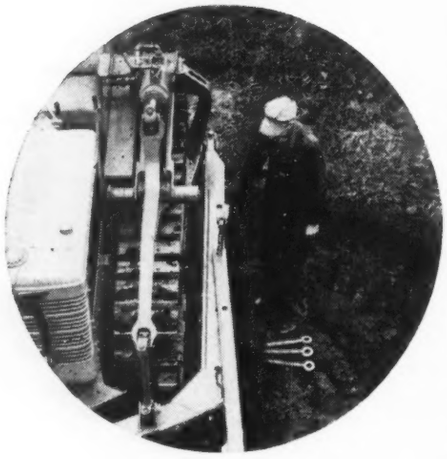
The Accepted TIMKEN AXLES Standard

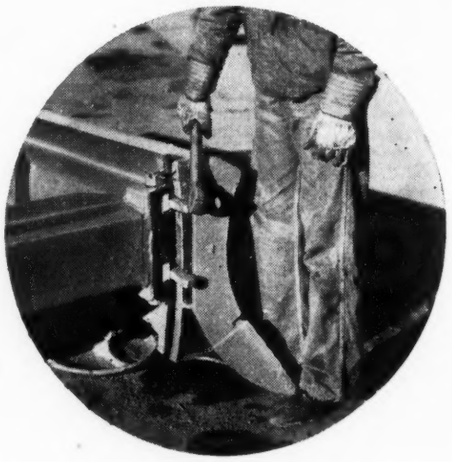
TIMKEN AXLES

THE TIMKEN-DETROIT AXLE COMPANY, DETROIT 32, MICH.
WISCONSIN AXLE DIVISION • OSHKOSH, WISCONSIN
TIMKEN AXLE BRAKE DIVISION • DETROIT 32, MICH.

ANGLING ••AND•• TILTING

that the OPERATOR Will Use!





"Sure . . . a blade angling and tilting feature can be a big help on plenty of jobs . . . but I'll be darned if I'll bother to angle or tilt if it takes a half hour to do it! I want to move dirt!" The Speaker? Almost any blade equipment operator. It's no problem to get <u>your</u> operators to use the effective angling and tilting features of Bucyrus-Erie Bullgraders, because they're both so easy to do — fast. Without tools, the operator angles the blade by pulling the landside pins, adjusting the blade to the correct angle, and replacing the pins. To tilt, he uses a landside pin to hammer out the wedges that hold the blade in position, shifts the blade to the tilt he wants, hammers the wedges back in place. Neither angling nor tilting takes more than a couple of minutes!

Both you and your operators will like the many other features of the Bucyrus-Erie Bullgrader, too: its easy handling through smooth hydraulic control and balanced-to-the-tractor design, its powerful digging down pressure, its complete visibility, its ability to handle so many jobs efficiently. Ask your International TracTracTor Distributor for complete details.

12T45

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

SEE YOUR INTERNATIONAL TRACTRACTOR DISTRIBUTOR

A BIG PLANT FOR THE BIG JOBS

. . . where low cost is all-important

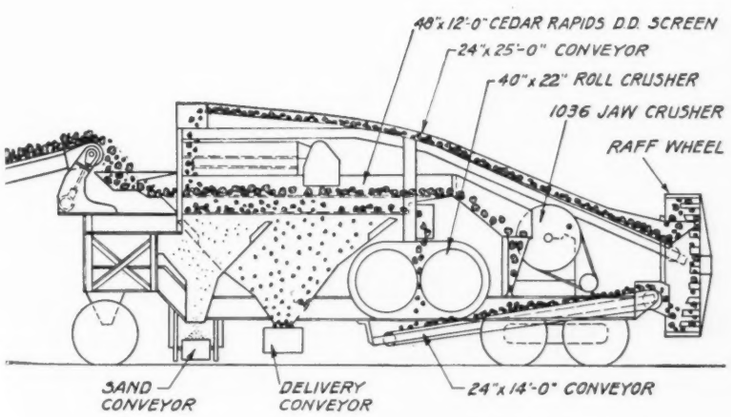
The Cedarapids Master Tandem

"Life Seal" conveyor bearings require no field lubrication. Quickly convertible to quarry plant by adding portable primary. No lost time for setting up and taking down between jobs. Ask for bulletin MT-1.

HERE'S a portable gravel plant that really lives up to its name—MASTER — master of low-cost operation for your big aggregate producing jobs. It contains all the features that mean big capacity, trouble-free operation and low cost. Horizontal vibrating screen assures greater capacity and closer grading. Large roller bearing jaw and roll crushers have plenty of capacity for smooth operation for every pit condition. V-belt and universal drives eliminate troublesome chains and sprockets. There are dozens of other exclusive features that make the Master Tandem today's most modern, all-purpose crushing plant. Get the facts from your nearest Cedarapids distributor.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.



Cedarapids

Built by IOWA

THE IOWA LINE

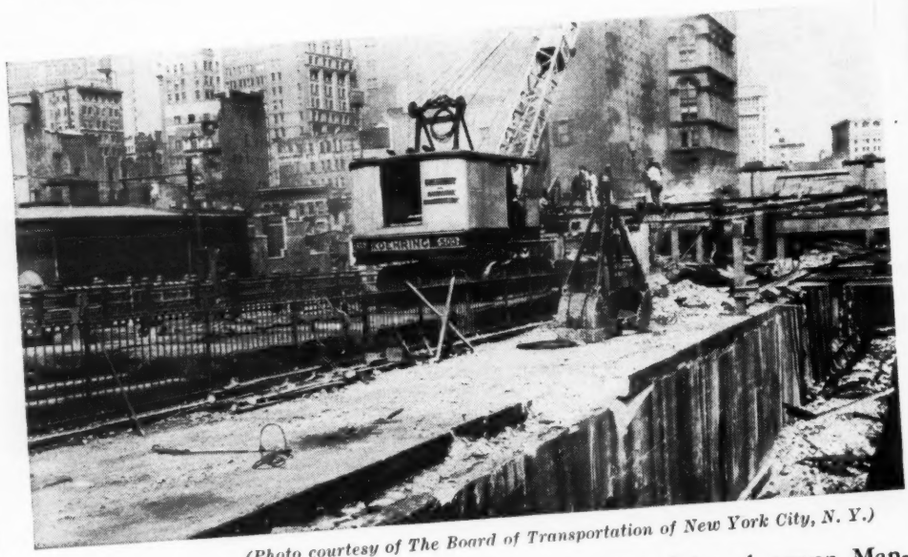
of Material Handling Equipment Includes

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS—STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS—TRAPS
PORTABLE POWER CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

Gulf Quality Lubricants and Fuels

help prevent delays on Brooklyn Bridge improvement!——

"With Gulf Products we get top performance from equipment, and freedom from operating troubles"——**says E. W. Foley**



(Photo courtesy of The Board of Transportation of New York City, N. Y.)

E. W. Foley, Inc., Brooklyn, New York, recently completed the major contract for extensive improvements to the famous Brooklyn Bridge, which spans the East River between Manhattan and Brooklyn. Like many other leading contractors, E. W. Foley uses Gulf lubricants and fuels.

"OUR equipment performed without a hitch on the Brooklyn Bridge job with Gulf lubricants and fuels in service—no breakdowns, and no delays caused by mechanical troubles," says E. W. Foley. "That's one big reason why we finished ahead of schedule, and kept our maintenance costs low."

The use of quality petroleum products is one of the surest guarantees of efficient job operation and lower operating costs for equipment—which add up to greater profits! That is why so many leading contractors engaged in all types of construction work specify Gulf lubricants and motor fuels.

Call in a Gulf Service Engineer before you start your next job—let him help you get better lubrication and more efficient equipment performance at no additional cost! Write, wire or phone your nearest Gulf office today.

GULF

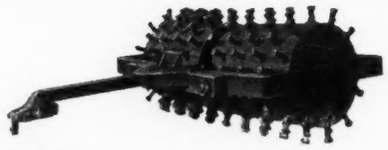
Gulf Oil Corporation · Gulf Refining Company

Division Sales Offices:

Boston · New York · Philadelphia · Pittsburgh · Atlanta
New Orleans · Houston · Louisville · Toledo

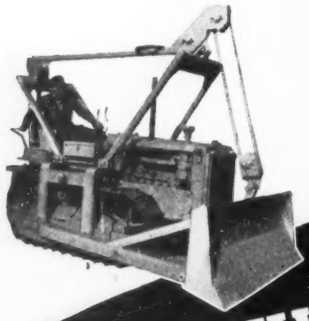
HARD AT WORK
ON THOUSANDS OF HURRY-UP JOBS
WHEREVER you hear the sound of a Barco Portable Hammer at work you can be sure the big job of reconversion and expansion is getting done. And all over the country that sound grows louder. For a Barco is the accepted tool on any job that calls for driving, drilling, breaking or digging. Its economy, its steady, dependable performance, its ability to multiply manpower, are winning it ever-widening favor as the pace of industry quickens. For full particulars write us immediately. Barco Manufacturing Co., Not Inc., 1812 Winnemac Avenue, Chicago, Ill.
BARCO
Portable Gasoline HAMMERS
BREAKING
DRILLING
TAMPING
DRIVING

BULLDOZERS & TRAILBUILDERS

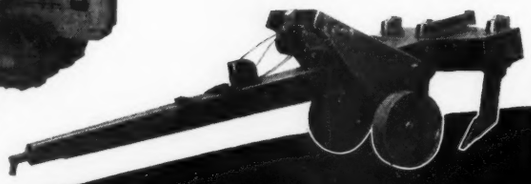


RIPPERS

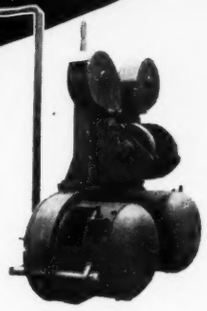
TAMPERS



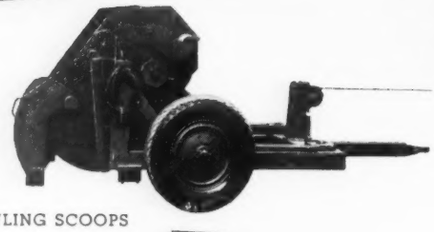
LOADERS



SOUTHWEST Construction Equipment *for every job!*



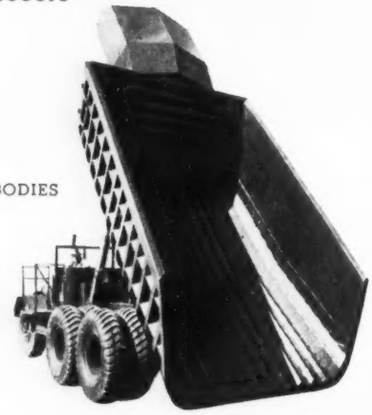
POWER CONTROL UNITS



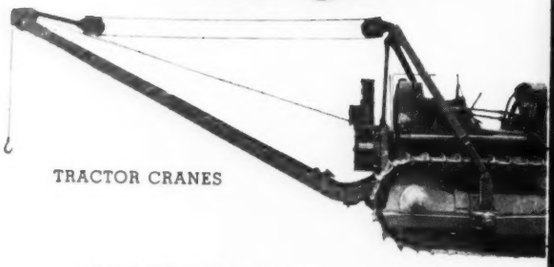
HAULING SCOOPS

Southwest's complete, standardized line affords construction men an opportunity to fill their needs from one dependable source. From start to finish, no matter whether Allis-Chalmers, Caterpillar, International or Cletrac tractors are used, an economical Southwest unit is available to bring you increased profits.

In addition to the standard line, special Southwest Dump Wagons, Tampers, Heavy Duty Compaction Units, etc., are giving outstanding performance on out-of-the-ordinary jobs all over the country . . . Why not let Southwest help solve YOUR problems?



DUMP BODIES



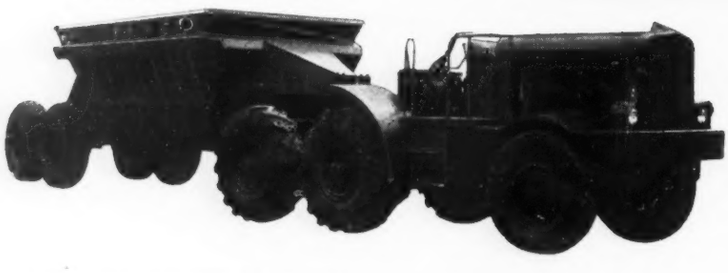
TRACTOR CRANES

CONSTRUCTION MACHINERY DIVISION

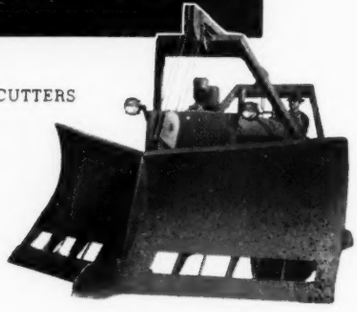
Southwest Welding & Manufacturing Company

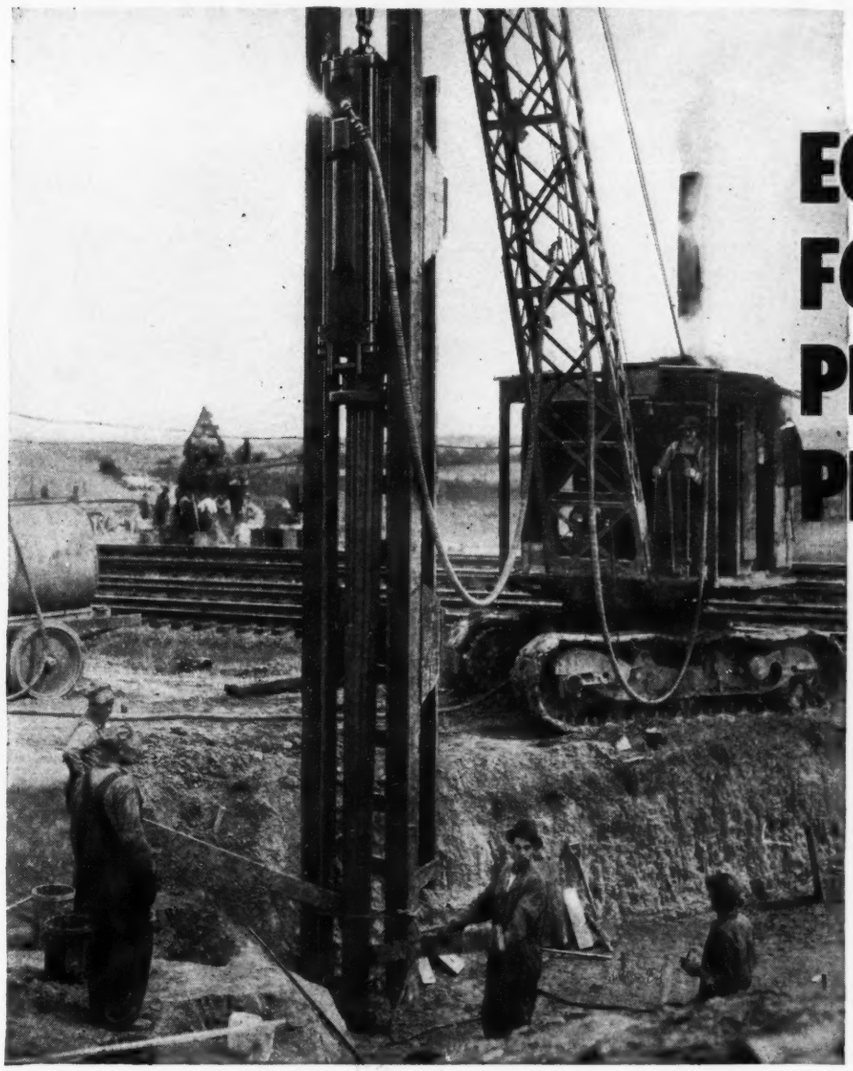
ALHAMBRA, CALIFORNIA

BOTTOM DUMP WAGONS



BRUSHCUTTERS





EQUIPPED FOR ANY PILE DRIVING PROBLEM

McKiernan-Terry 9B3 Pile Hammer driving tapered monotube metal piles, on a Batavia, N. Y. project of the Bero Engineering & Construction Co.

Piling material may vary, soil to be penetrated varies greatly, location and working conditions are rarely twice the same. But McKiernan-Terry Pile Hammers are found always ready with the necessary power and dependability, in right sizes, and with every needed attachment for handling any type of pile driving job.

Embodying the widely varied experience of more than forty years of designing, manufacturing and installing pile driving equipment, McKiernan-Terry Pile Hammers and Extractors have become the standard of choice by leading engineers and contractors.

Available in a complete line of ten double-acting and five single-acting hammers, and two double-acting extractors. Extensive facilities of two large plants at Dover, N. J. and Harrison, N. J. assure prompt deliveries.

WRITE FOR FREE BULLETINS

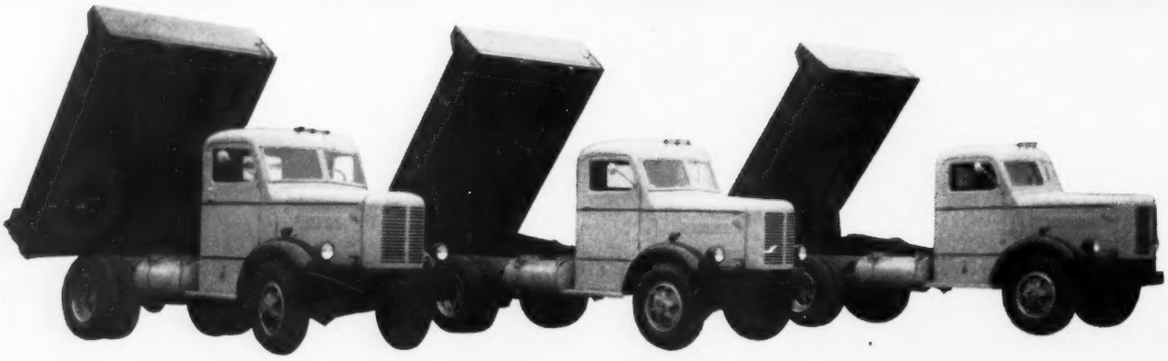
Full information, specifications, photos, diagrams, etc. on double and single-acting hammers. Ask for Bulletins 55 and 57. Send today.

McKiernan-Terry

CORPORATION

14 PARK ROW NEW YORK 7, N. Y.

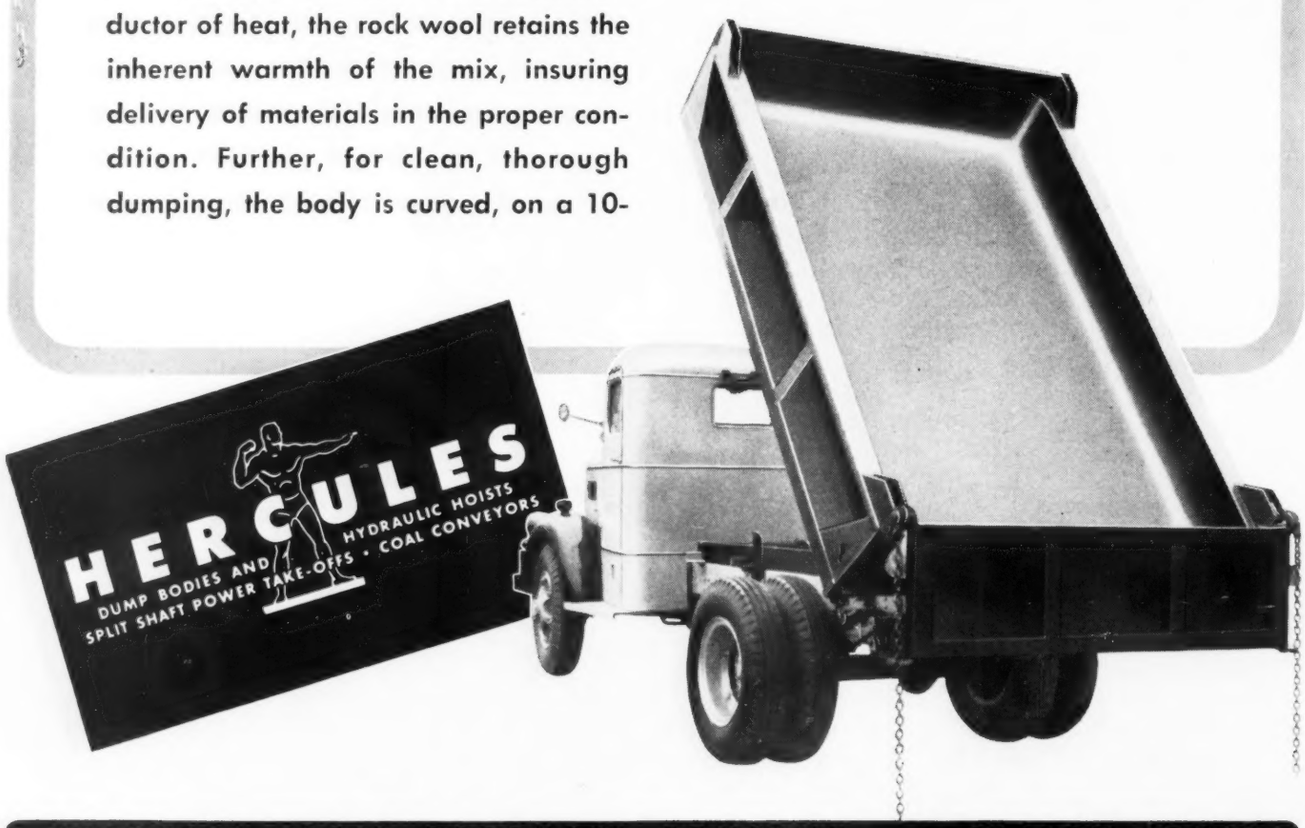
SERVED HOT • • • IN THE SHELL!



TYPICAL of Hercules built-for-the-job dump body units are these Hercules asphalt bodies, incorporating design and construction features that fit them for the special tasks they must perform. Hauling and dumping a hot mix such as asphalt is no ordinary job — and these are no ordinary units.

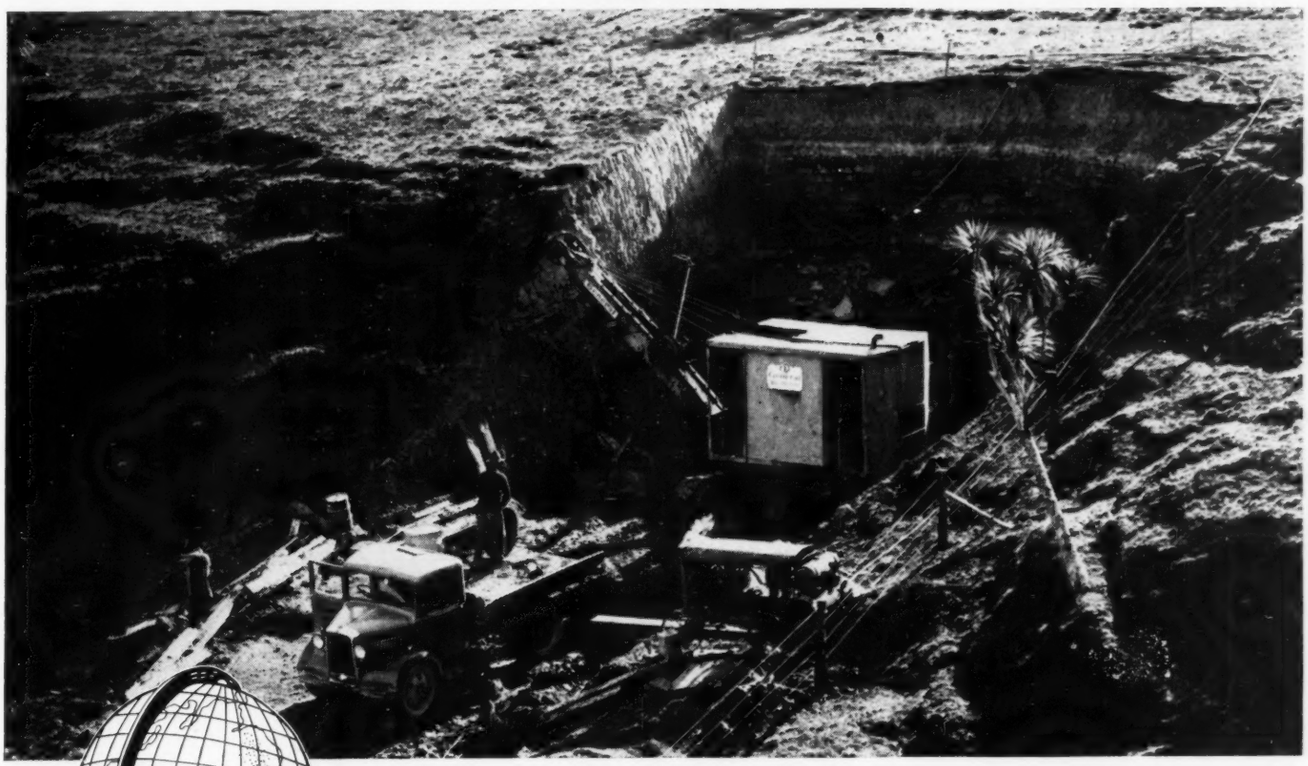
For example, between the two 8-gauge steel sheets that form the body shell is a 2-inch layer of rock wool. A non-conductor of heat, the rock wool retains the inherent warmth of the mix, insuring delivery of materials in the proper condition. Further, for clean, thorough dumping, the body is curved, on a 10-inch radius, at both sides and at the front end, eliminating any corners in which the asphalt might stick.

The know-how and experience that form the background for Hercules design engineering and precision manufacturing methods can make any hauling and dumping job profitable. We'd like to show you the facts . . . then you be the judge. Address inquiries to **Dept. B.**



HERCULES STEEL PRODUCTS COMPANY . . . GALION, OHIO

DIGGING IN *"Down Under"* . . .



With a GENERAL!

It's not surprising to find this veteran General shovel still turning in a full day's work every day, because 98% of all the Generals ever built are still in service. This particular General is shown at work on the Auckland-Warkworth Highway "down under" in New Zealand.

Such world-wide usage is evidence of the confidence construction and excavating engineers place in General-built equipment; confidence that is repaid by years of dependable, economical service. General's record of performance on the toughest construction jobs all over the world is a matter that deserves your serious consideration when planning to purchase new equipment.

Write today for complete information that points out how design, materials and precision construction are teamed up to provide General's built-in serviceability, its ability to do more work at less cost. And, if you'd like to know what's new in construction equipment, ask your nearest Distributor for details about the amazing new General Type 10—Model 105—the all-purpose rig, one-man operated, one-engine powered and mounted on pneumatic tires!

THE **OSGOOD** COMPANY
SHOVELS, DRAGLINES
CRANES
CRAWLER & WHEEL MOUNTS
DIESEL, OIL, GAS, ELECTRIC

Associated with The Osgood Company

GENERAL EXCAVATOR CO.
CRANES-SHOVELS GENERAL MARION OHIO U.S.A. OSGOOD
MARION, OHIO

GENERAL
CRANES, DRAGLINES
AND SHOVELS
DIESEL, GAS, ELECTRIC

Better Trucks for YOUR Business!

"Our 20 Ford Units Stay on the Job"

It doesn't take long for the profit on a job to vanish, if truck equipment can't stand the pace. That's why the rugged reliability and endurance of Ford Heavy Duty Trucks have made them such favorites in the construction field as well as on street and highway work.

Contractor C. W. Shirey, of Waterloo, Iowa, is strong for Ford Trucks. He wrote recently:

"The splendid way we've been able to maintain our Ford units, handling ready-mix concrete deliveries, for the last ten years, has been very gratifying. Eleven of our twenty Ford units carry mixer equipment, and they've been going every day, long hours—especially all through the war period. Through the service given by our Ford dealer, we've kept them running, and kept tie-ups to a minimum. Rest assured we'll continue to use Ford units."

The new Ford Trucks are better than ever—engineered for more economy, more reliability, longer life. There's a new Ford Heavy Duty Dump Truck chassis that's a stand-out value. Ask your Ford Dealer about it!

Ford

ADVANCED ENGINEERING IN NEW FORD TRUCKS

More Economy and Endurance
Easier Servicing

A STILL GREATER 100 HP V-8 ENGINE with NEW Ford steel-cored Silvaloy rod bearings, more enduring than ever in severe service • NEW aluminum alloy cam-ground 4-ring pistons for oil economy • BIGGER, more efficient oil pump and IMPROVED rear bearing oil seal • NEW longer-lived valve springs • NEW improvements in cooling • NEW efficiency in ignition • in carburetion • in lubrication • in ease and economy of servicing operations • And available in all truck chassis except C.O.E. units—the rugged, thrifty 90 HP FORD SIX-CYLINDER ENGINE, with many important advancements.

FORD CHASSIS ADVANTAGES: Easy accessibility for low-cost maintenance • Universal service facilities • Tough, forged front axles • Extra-sturdy rear axles with pinion straddle-mounted on 3 large roller bearings, ¾-floating type in light duty units, full-floating in all others • 3 axle ratios available (2 in 1-ton unit) • 2-speed axle available in heavy duty units at extra cost • Powerful hydraulic brakes, large drums, cast braking surfaces • Rugged 4-speed transmission with NEW internal reverse lock optional at extra cost on light duty units, standard on all others.

FORD TRUCKS

MORE FORD TRUCKS ON THE ROAD • ON MORE JOBS • FOR MORE GOOD REASONS

PULVERIZING CLAY

LICKING ONE OF THE TOUGHEST HIGHWAY AND AIRFIELD CONSTRUCTION PROBLEMS

SEAMAN MIXER reducing heavy, colloidal clay containing considerable moisture. By drying through aeration, to proper moisture content, the SEAMAN makes excellent pulverization possible.

PULVERIZING CLAY. AT THIS STAGE ABOUT 40% PULVERIZING HAS BEEN EFFECTED.

WIDELY USED AS A BINDER-SOIL IS EXCELLENT MATERIAL

BUT.. to be efficient as a binding agent and to avoid expansion and contraction of lumps — with injury to a mix, — clay must be thoroughly pulverized. Frequently 25% to 50% of the high colloidal clay binders — often brought to a job after a long haul,— is wasted because specified pulverization cannot be obtained. The SEAMAN MIXER, however, even in the case of heavy clays, efficiently and thoroughly effects pulverization,— at drastic reductions in machine time and labor. And with the SEAMAN,— the lighter, more friable clay can readily be pulverized and mixed with other materials at the same time,— two functions in one,— with a far greater daily net output of finished, in-place mix, well-leveled and ready for compaction.

MIXING CLAY AND AGGREGATE FOR NATURAL SOIL STABILIZATION BY CORRECT PROPORTIONING OF BINDER AND LOAD-BEARING SOILS.

TYPIFYING FINISHED CLAY PULVERIZATION OBTAINED WITH THE SEAMAN MIXER.

C-116

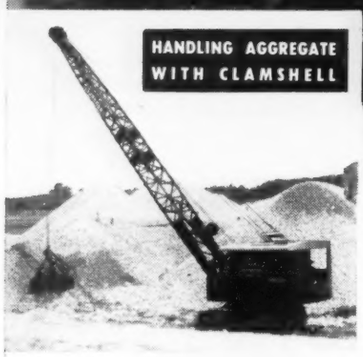
"SOIL STABILIZATION METHODS" — A most informative book compiled by SEAMAN ENGINEERS. Write for Bulletin C-24.

PIONEERED BY SEAMAN

SEAMAN MOTORS

MILWAUKEE 3, WISCONSIN

First to Last it's LINK-BELT SPEEDER!


HANDLING AGGREGATE WITH CLAMSHELL

PLACING CONCRETE OR ERECTING STEEL

CLEANING UP, GRADING WITH DRAGLINE

BEGIN—CARRY ON—WIND UP THE JOB—WITH ONE CONVERTIBLE LINK-BELT SPEEDER

Moving or removing earth, rock, aggregate, or any similar material, is easily, efficiently, economically done, with a LINK-BELT SPEEDER "Shovel-Crane." Ample power supply, easy, precision controls and high maneuverability make these machines favorites with the operators; their economy of operation and upkeep, plus their wide range of application, rate them as top-grade profit-makers.

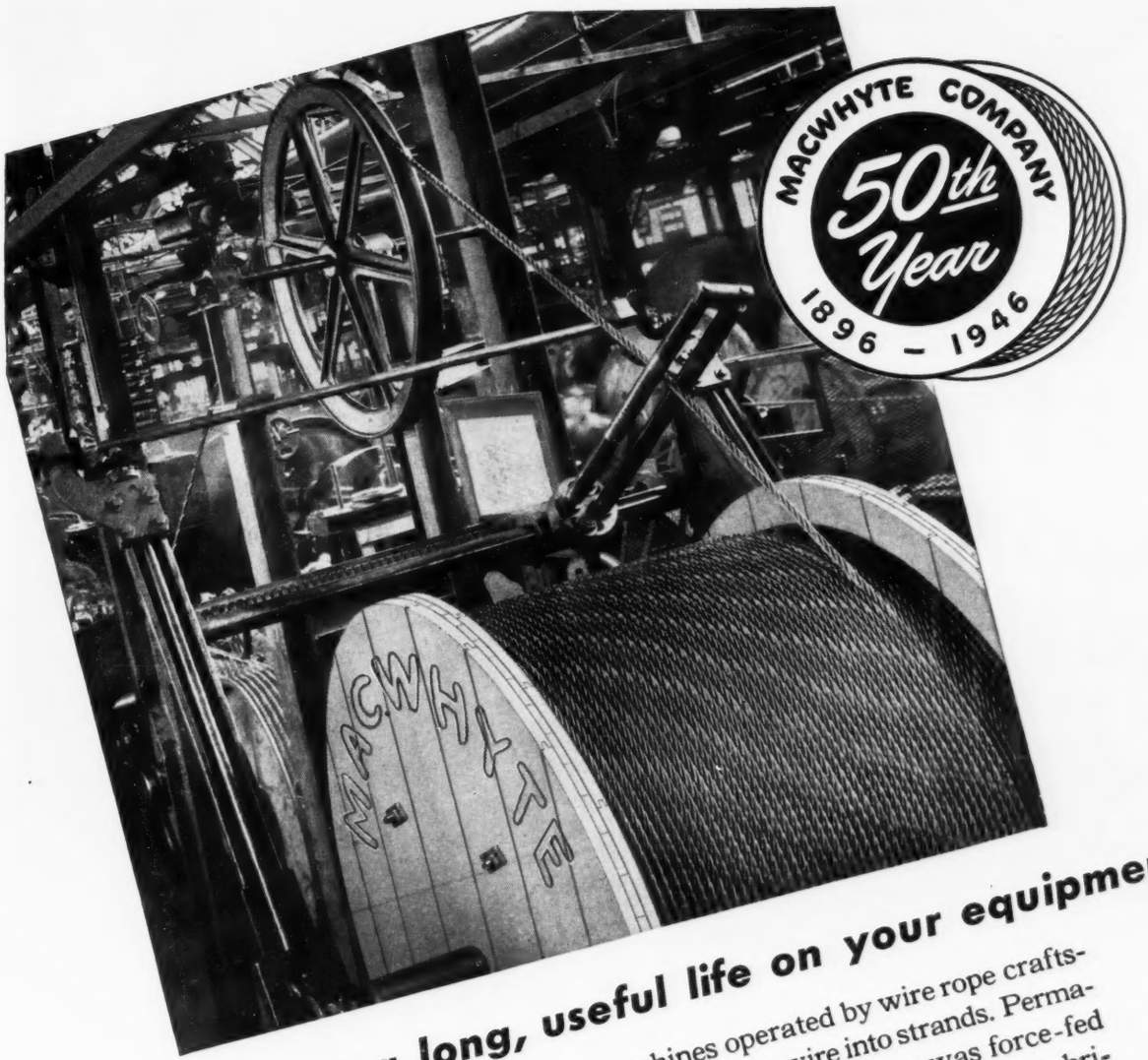
For Prompt, Efficient, Convenient Sales and Service:
There is a Link-Belt Speeder Distributor Located Near You

10,223

LINK-BELT SPEEDER

Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO 9, ILL.
A DIVISION OF LINK-BELT COMPANY



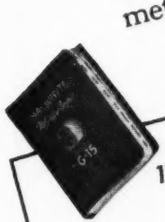
Ready to start a long, useful life on your equipment

Here you see Macwhyte Wire Rope as it comes from the closing machine. It is now ready to start giving the long service that has been so carefully built into it.

Select quality steel rods were its beginning. They were scientifically heat-treated and cold-drawn, into tough, metallurgically uniform wire. Precision machines operated by wire rope craftsmen layed the wire into strands. Permanent internal lubrication was force-fed around each wire. Closing the lubricated strands completed the wire rope that will give longer, more economical performance on your equipment.

Macwhyte distributors and factory representatives are at your service.

Make MACWHYTE your headquarters for WIRE ROPE AND SLINGS



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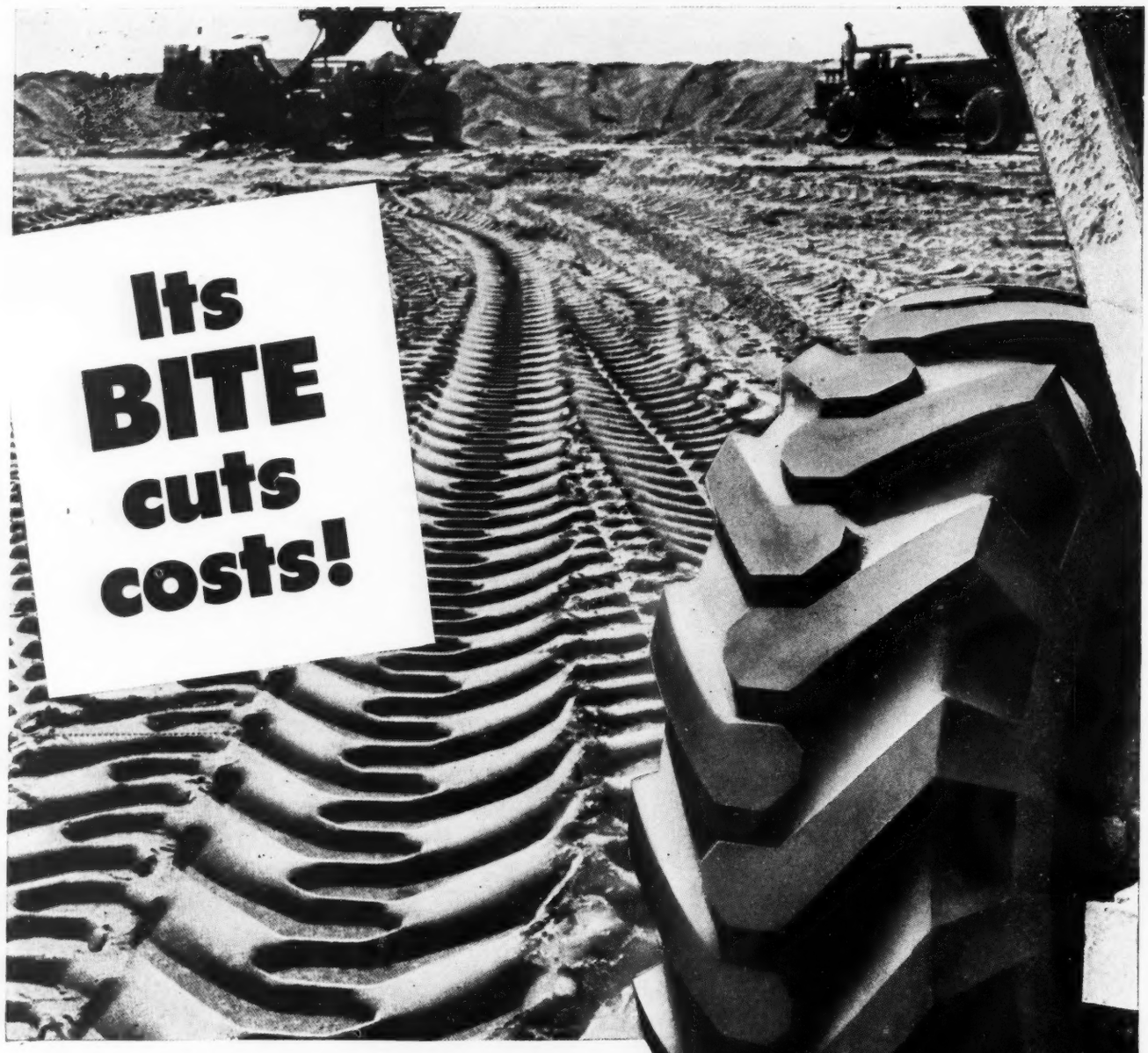

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Construction Methods

WALDO G. BOWMAN, Editor

Volume 28 | MARCH, 1946 | Number 3

DREDGE BUCKETS LIFT ROCKS OFF COULEE'S TOE

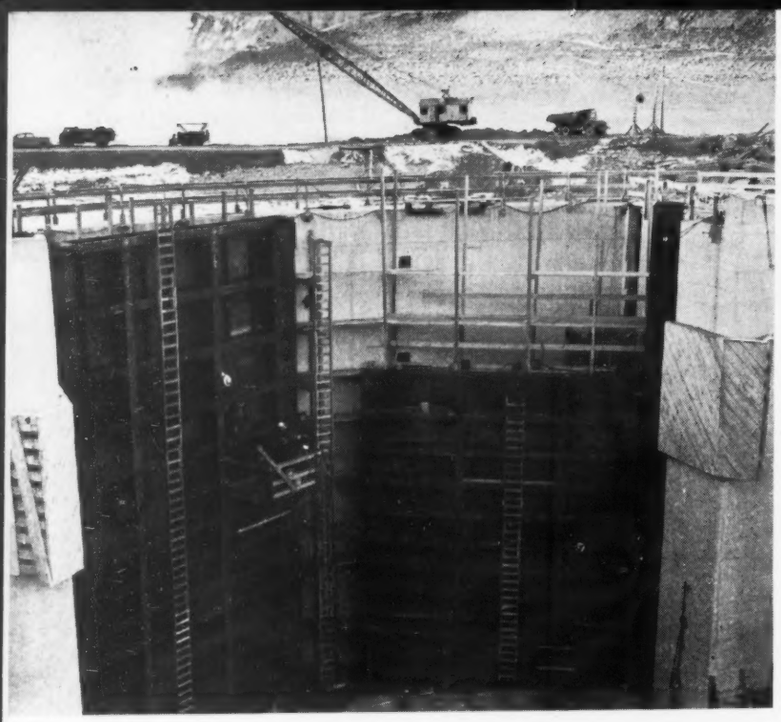
TO RID THE POOL below Grand Coulee Dam on the Columbia River in Washington of rocks, boulders and other accumulations the U. S. Bureau of Reclamation purchased four 3-cu. yd. heavyweight, round nose, lever-arm dredging buckets. Each bucket, equipped with seven specially heat-treated drop-forged chrome nickel steel teeth, weighs 16,000 lb.

The buckets, Blaw-Knox units, are designed with a weight distribution that results in improved dredging performance and maximum rigidity, strength, and long life of bucket parts normally subjected to greatest abuse. The main hinge of the bucket is designed to accommodate peak torsional stresses that are imposed when the bucket grabs a boulder off center or at one corner.

The use of these heavy-duty dredging buckets was necessitated by the fact that the water, coming over the spillway, generates a churning action in the pool below, causing powerful cross currents which redeposit rock and boulders in the immediate vicinity of the downstream side of the dam. If allowed to remain in the pool, the boulders, through the action of the turbulent water, would cause excessive abrasion and pounding along the concrete base of the spillway that might tend to deteriorate the structure.

FROM SPILLWAY POOL below Coulee Dam 3-cu. yd. round-nose, lever-arm bucket dredges rocks and boulders. (Inset) **WEIGHING** 16,000 LB., 3-cu. yd. bucket has forged, chrome nickel teeth. Main hinge is designed for peak torsional stresses when bucket grabs big boulder off center.

THIS MONTH'S NEWS REEL



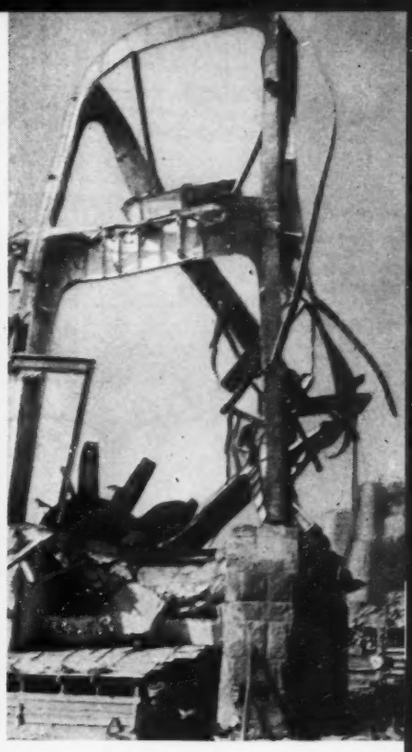
MITRE GATES will form opening to spillway bucket caisson drydock at Grand Coulee Dam. A 1,600-ton floating submersible type steel caisson will be erected within drydock for use in making underwater repairs to spillway buckets. Concrete wall beyond mitre gates, now serving as cofferdam, will be tipped outward to become floor of approach channel upon completion of gates.

U.S. Bur. Reclamation Photo

PAN-AMERICAN AWARDS of American Road Builders' Association for outstanding achievement in development of Pan-American Highway are made at annual A.R.B.A. banquet in Chicago Jan. 16. North American recipient is THOMAS H. MACDONALD (left), commissioner, Public Roads Administration. GILBERTO DEL ARENAL (right), Mexican director general of highways, accepted Latin American award for Montes de Oca, president, Banco Internacional, S.A., of Mexico. Presentation was made by CONGRESSMAN PAUL CUNNINGHAM of Iowa.

EXPANSION PROGRAM (below) at Tennessee Eastman Corp., Kingsport, Tenn., will cost more than $10,000,000. This 6-story 200-ft. square structure of steel, brick and concrete is one of three to be built.

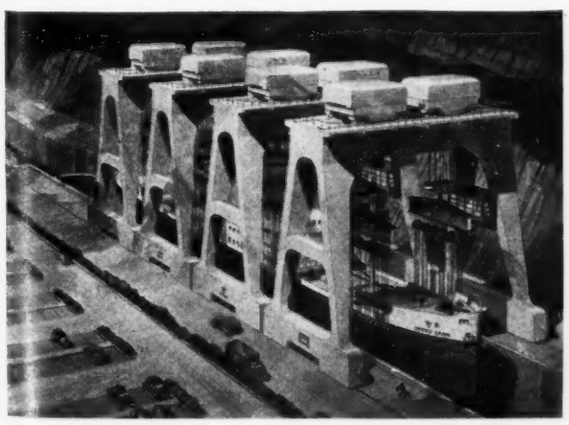
GROUND WAS BROKEN recently at Memorial Cancer Center, New York City, when MAYOR WILLIAM O'DWYER, at controls of Lorain power shovel of Thomas Crimmins Contracting Co., foundation subcontractor for Turner Construction Co., took first dipperful of earth from site of 15-story $2,000,000 structure that will house Sloan-Kettering Institute for cancer research, to be financed by $4,000,000 fund now being raised. Architects for building are Skidmore, Owings & Merrill.

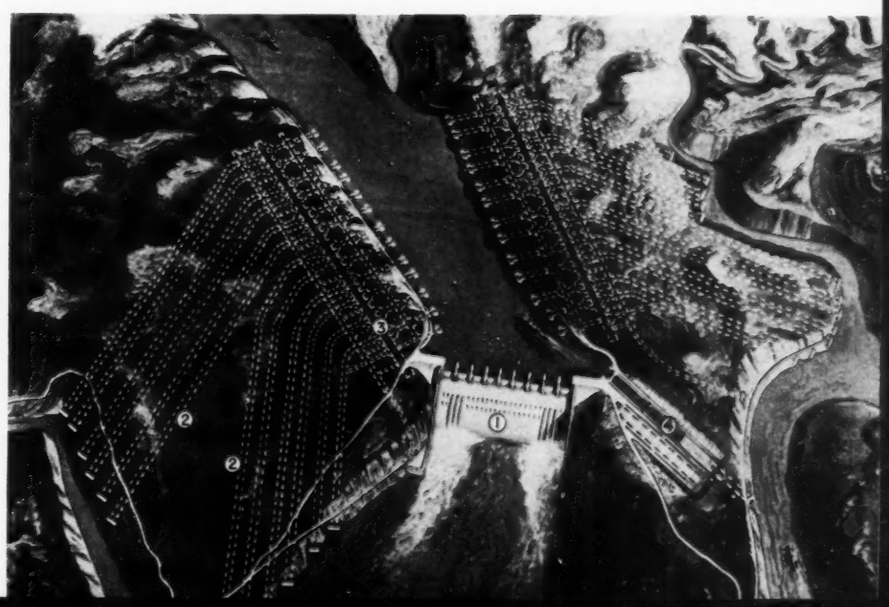


DNIEPER POWER STATION is rebuilt by Soviet workers. In seven months 218,000 cu. yd. of reinforced concrete blown up by Germans was broken down and removed; tons of twisted structural steel, like that at right were dismantled; 24,000 cu. yd. of earth was moved; and eleven buttresses were rebuilt. Sovphoto

BRAZILIAN ARMY ENGINEERS meet U. S. Army Chief of Engineers. Here to study North American methods, they will make extensive tour of Army Engineer projects throughout United States. They are (left to right): MAJOR RODRIGO OCTAVIO JORDAO RAMOS, supply specialist; LIEUT. COL. ANTONIO BASTOS, technical highway specialist; COL. DECIO PAMMEIRO DE ESCOBAR, specialist in engineer material; LIEUT. GEN. RAYMOND A. WHEELER, Chief of Engineers, U. S. Army; BRIG. GEN. FRANCISCO BORGES FORTES DE OLIVIERA, Chief of Engineers, Brazilian Army; COL. FERNANDO DE MASCIEMENTO FERTANDES TAVORA, specialist in troop organization, and CAPT. HUBBERTO MELCHOIR CARNEIRO DE MENDONCA, aide de camp to Gen. Borges Fortes.

WORLD'S GREATEST HYDRO PROJECT planned for Chinese government in Yangtze River Gorge (below, right) by John Savage, consulting engineer, U. S. Bureau of Reclamation, includes (1) concrete dam "higher than Boulder and bigger than Grand Coulee," (2) 12 diversion and power tunnels on each side of river, (3) penstock tunnels serving 96 generators at 108,000 kw. each, (4) ship lock with single 700-ft. lock connected to downstream tributary by 200-ft. high ship tunnel. Alternate scheme to water lift in lock is multiple mammoth gantry cranes (left) that will raise and lower specially-designed river vessels through system of equalizing hoist cables. Small craft will be handled in big basin by cranes. Total cost of project is estimated at $1,000,000,000. Drawings by J. MacGilchrist





Frame Houses Fabricated in Panels

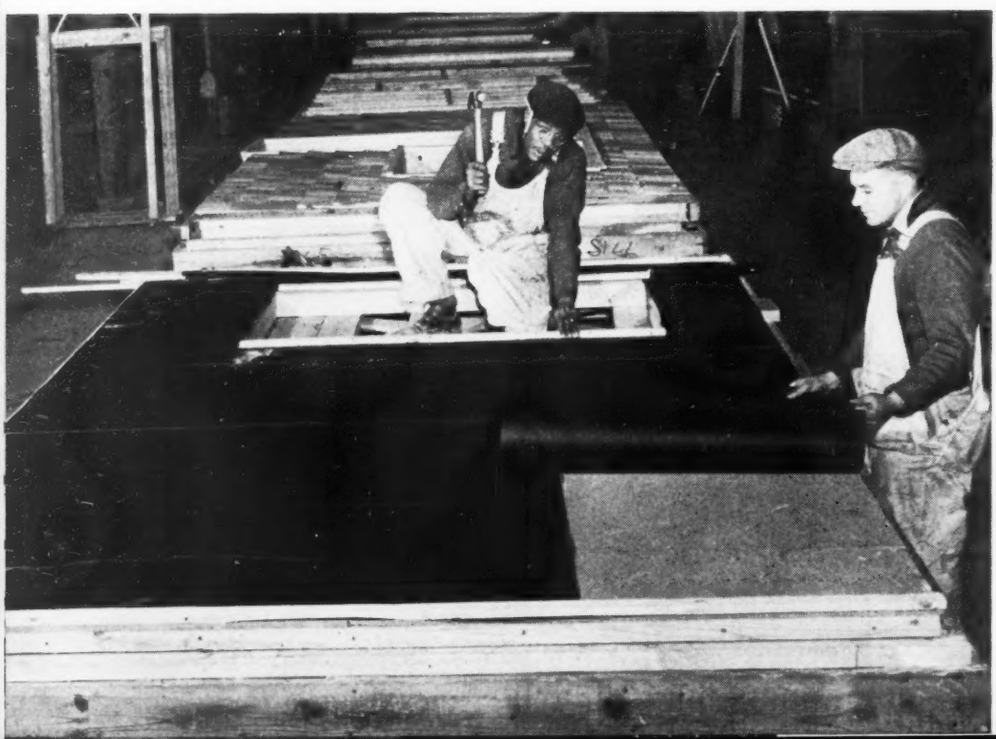
A BROOKLYN BUILDING CONTRACTOR, the John A. Johnson Contracting Corp., has gone into the prefabricated house business in a big way. In a mill at Pemberton, N. J., about 20 mi. south of Trenton, Johnson is turning out precision-built, shop-assembled components for complete shells of several models of single-family frame houses. The shop produces accurately matched and marked units for field erection of the shell of the house only. The foundation, shell erection, interior wall and ceiling finish, plumbing, heating, wiring and fixtures, including bathroom and kitchen equipment, all must be furnished by local contractors. As these shop-assembled shell units are sold f.o.b. mill through established dealers and builders, the system is not competitive with operative builders.

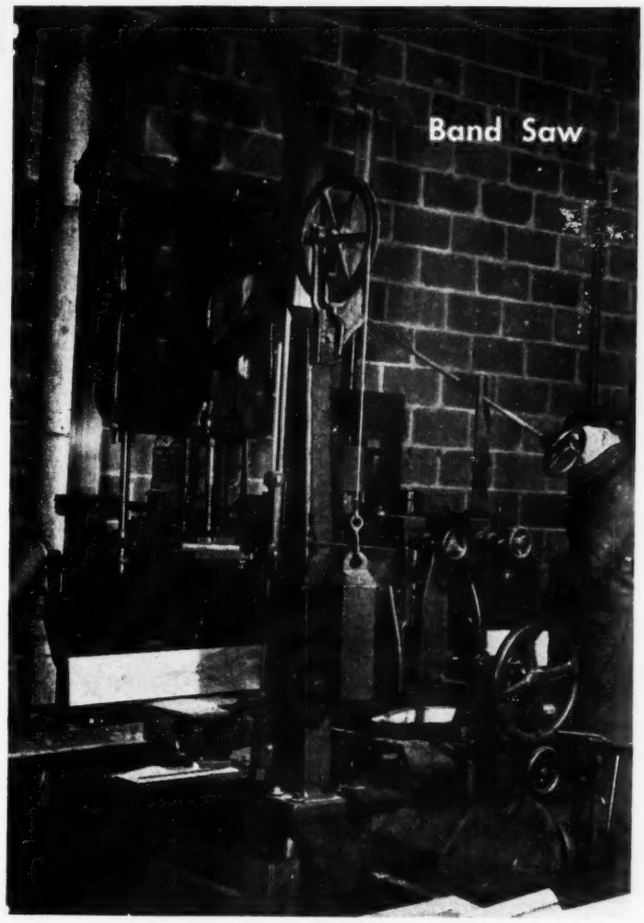
At present all models in production are one-story houses, but the manufacturer is ready to produce 1½- and 2-story models to satisfy future market demands. The houses are all-wood construction, with floors, walls and roof sheathing applied in shop-assembled panels. Standard models have either shiplap or shingle siding with shingled gable roofs. A more expensive design is produced from time to time when hard-to-get waterproof plywood is available; this is a flat-roof unit completely inclosed with plywood.

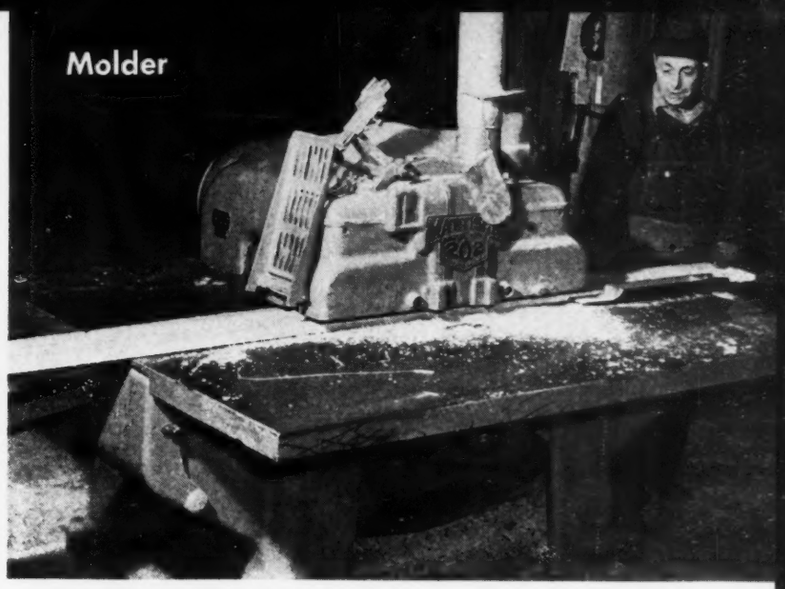
Precision jigs are used for all shop work. Precut ceiling joists and roof rafters, as well as all other loose pieces, are bundled and marked in accordance with a key plan and erection guide furnished with each house. Deliveries can be made within reasonable distances within 10 days of receipt of an order. The average time of erection is 6 days with a crew of 5 carpenters.

All models meet FHA standards of construction for FHA guaranteed-mortgage financing. Floor panels, with rough flooring attached, are set on 2x6-in. plates anchored to the foundation wall by the local builder. On top of the rough floor applied at the mill, the floor panels carry, along their exterior edges, sill guide plates designed with a longitudinal tongue which fits into a groove in the sill of the wall plates. Interior panels also slide into guide plates

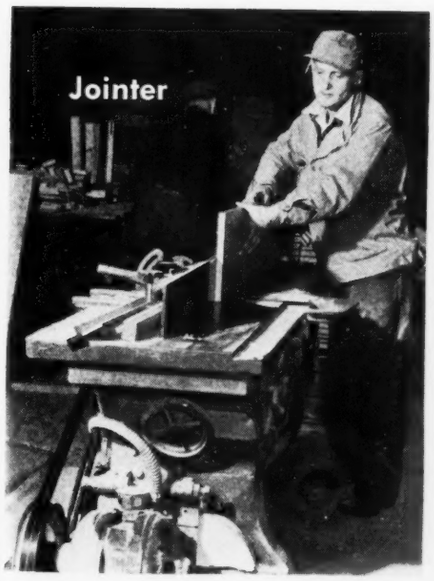
WALL PANEL SHEATHING (below) consists of ½-in. fiber insulating board nailed to studs and covered with 15-lb. building paper, over which shiplap or shingles are applied.

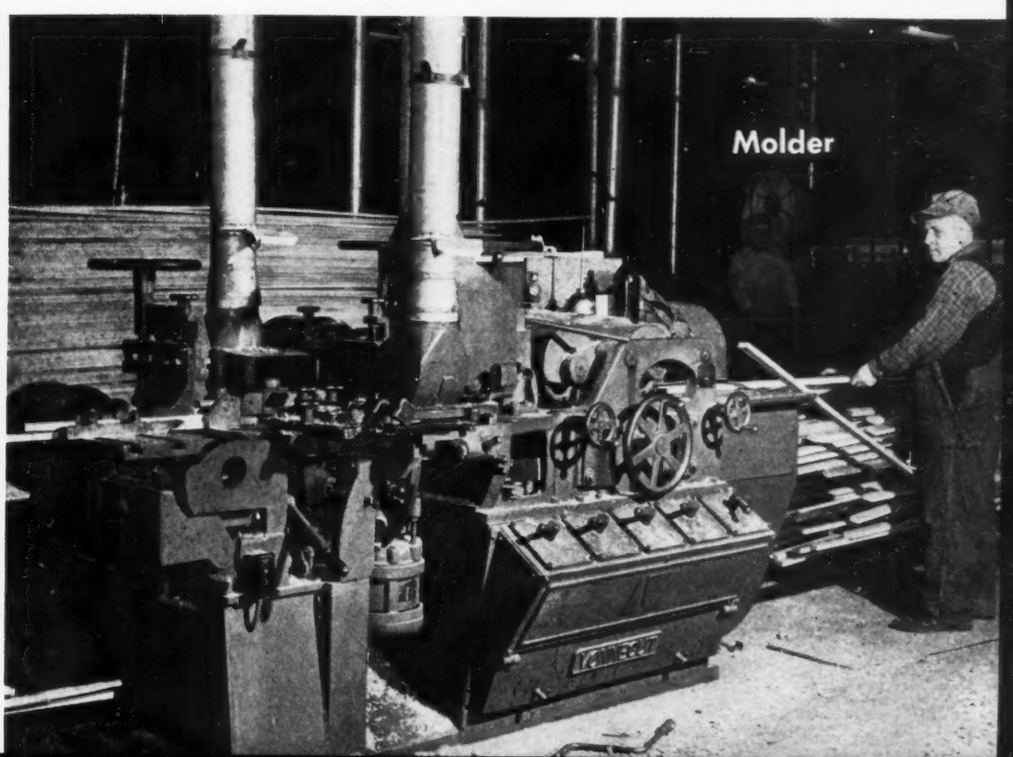


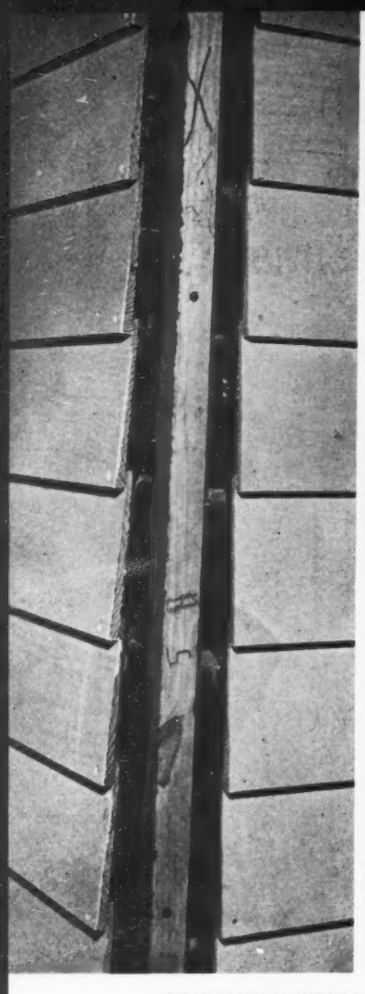


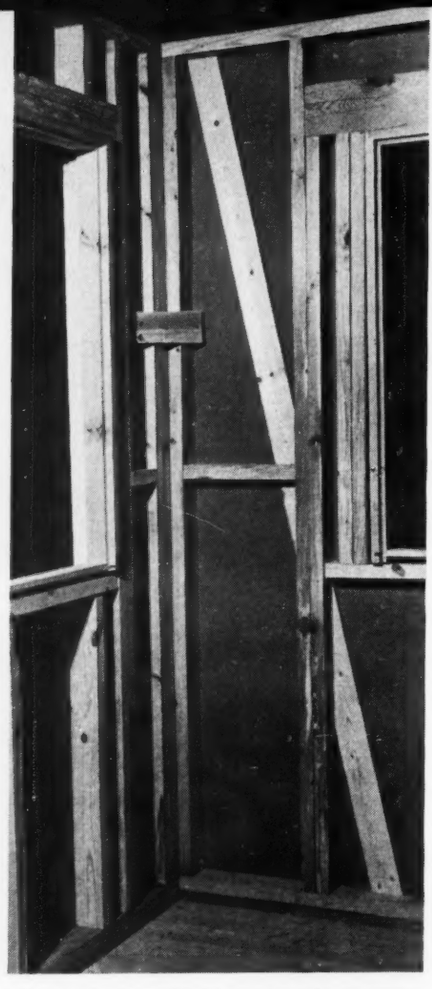


INDIVIDUAL PIECES are cut and preshaped by series of power tools. Some of the machines are fed by roller conveyor.









INSIDE AND OUTSIDE details of corner assembly show how corner sections interlock. They are spiked together during erection in field, after which corner boards are applied. Note inside corner brace set into studs.

attached to the floor panels. Wall panels are tied down to the foundation by 26-ga. black iron straps, nailed to the floor frame member and to the foundation plate. Finish flooring of 25/32-in. tongue-and-groove oak, is laid in the conventional manner in the field.

Joints between units come at corners and partition intersections. Wall panel studs, 2x4 in., are spaced 16 in. on centers, and each corner wall panel is diagonally braced with a 1x4-in. strip cut into the studs. For additional rigidity a 2x4-in. plate is spiked in the field on top of the wall panel plates, lapping the joints. On shingle siding exteriors slip shingles are used at the joints to eliminate battens. For shiplap siding the siding joints are staggered in shop fabrication, and filler pieces are installed in the field.

Additional insulation, if desired, can be installed between the studs, joists and rafters in the field. Interior partition finish, applied by the local builder, can be of any type that can be applied to wood studding.

At the Pemberton mill each unit assembly is built up complete from start to finish on one jig bench. Jig setups for seven different models at one time are arranged over the 160,000 sq. ft. of shop floor space. A separate jig is provided for each slight modification of a panel. An average of 3½ men is required for manning each jig, and each shift employs about 126 mechanics in addition to the laborers engaged in handling raw material and finished units. As the panels are finished, they are stacked on wood pallets for moving by industrial trucks which pick up the pallets with hydraulic work lifts.

After the lumber reaches the mill, the pieces move from one operation to the next over some 6,000 ft. of roller conveyor. Cutoff saws are set up in a row to

FLOOR PANEL (below) is assembled in precision jig on work table. Diagonal sub-flooring is trimmed by power hand saw.

make the necessary square, bevel or miter cuts as the pieces move down the saw line. Then the preshaped and properly cut pieces are delivered to a jig setup for assembly of a complete wall or floor panel.

The shop, rebuilt as a modern, steam-heated plant after being destroyed by fire a year ago, contains the following equipment: one band saw, three molders, two straightline rip saws, 26 cutoff saws in the machine department, with others scattered throughout the mill for odd cutting during panel assembly, 11 table saws with both tilting arbor and rolling top, one jointer, one double-end tenoner, two chain mortise machines, 40 portable hand-held power saws, and 12 portable bench sanders.

At present the mill is equipped with precision jigs for the production of 18 one-story models. Depending upon the models in production, the plant can turn out from 30 to 50 houses per day. The shell for the four-room model requires 8,200 f.b.m. of lumber.

PREFABRICATED FRAMES and doors, complete with hardware, are individually crated for shipment to owners.

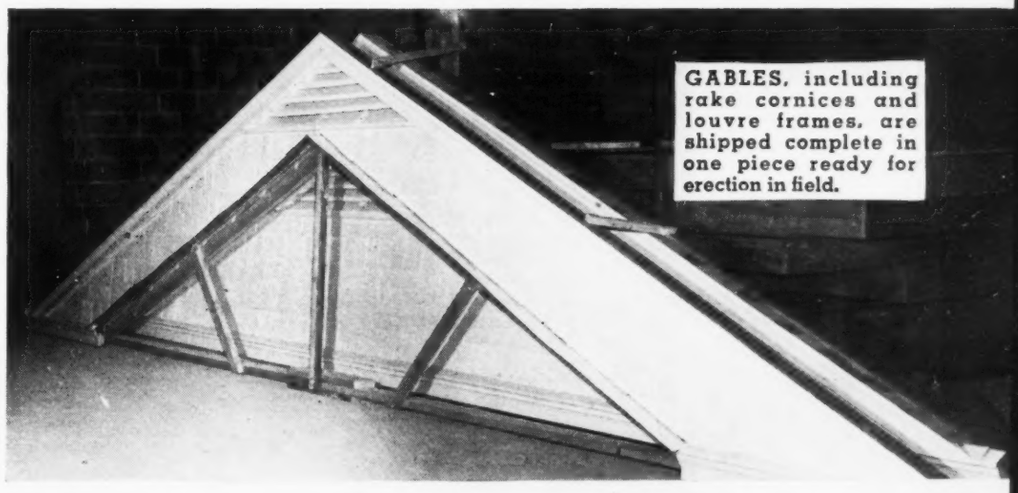
Prices Average $4 Per Sq. Ft.

Prices for the shells, which include only the frame, exterior, inclosure and flooring, run from $2,527 for a four-room dwelling with 640 sq. ft. inclosed area ($4.00 sq. ft.) and an 80-sq. ft. porch, to $6,136 for an L-shaped six-room house connected by a covered portico in a second ell wing to an attached garage. Outside dimensions of this house are 62x28½ ft.; the cost is slightly under $4 per sq. ft. Lower prices are quoted to builders who buy in lots of ten or more.

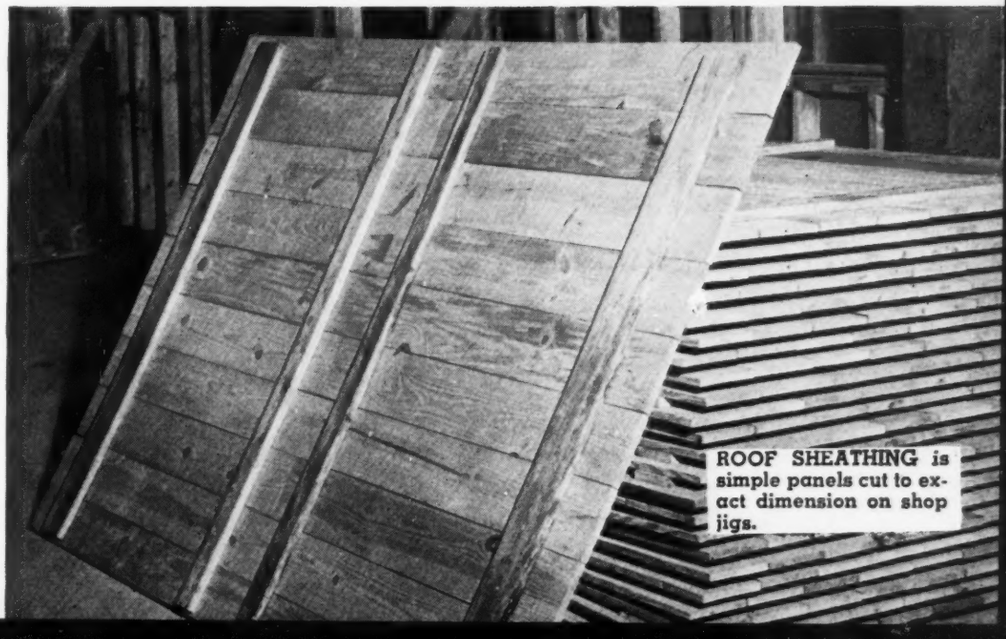
To figure the cost of a completely equipped house, exclusive of land, the manufacturer recommends that the shell price be multiplied by 2¼ to 2½, depending upon the refinements wanted.

John Wanamaker department stores, in both New York City and Philadelphia, have furnished full-size models on exhibit.

John A. Johnson, president of the contracting corporation bearing his name, Edwin Johnson, vice-president, and George Siebert, assistant secretary, are handling the house fabricating part of the business. At Pemberton Wm. Shea is shop superintendent in charge of the assembly operations. The Johnson Corp. has tentative plans for opening two more assembly plants, at Conway, S. C. and Johnson City, Tenn.



GABLES, including rake cornices and louvre frames, are shipped complete in one piece ready for erection in field.



ROOF SHEATHING is simple panels cut to exact dimension on shop jigs.

BRIDGE BEARINGS SEALED to Stop Pier C

By W. J. LaFLEUR
Assistant Civil Engineer, New York State Department of Public Works

THERE IS AN OLD CHINESE PROVERB that goes something like this. "When we are born we start to cry; each day we live we find out why." Incongruous though it may seem, that old proverb themed the writer's first reaction as he was rowed across the narrows of Lake Champlain, in the summer of 1944, to view the piers of the Lake Champlain bridge. An inspection of the five major substructures from below indicated unmistakably that something was wrong with the bearing details.

The structure was built for the Lake Champlain Bridge Commission and opened to traffic Aug. 27, 1929, as a toll bridge. It crosses a narrow section of Lake Champlain near Port Henry, N. Y., connecting Crown Point, on the south, or New York end, with Chimney Point, in Vermont, at the north end. There are 14 spans, totaling nearly 2,200 ft. in length, arranged as follows:

Beginning at the New York abutment, there are two, pinned-leg viaduct spans of 50 ft. each; one 49 ft. 6 in. simple viaduct span; two, deck-truss, continuous spans of 225 and 270 ft.; one deck truss anchor span of 290 ft.; the arched, channel span, 434 ft. in length, rising above the roadway; anchor span of 290 ft.; one simple deck-truss, span of 270 ft.; one viaduct, simple span of 49 ft. 6 in.; then four, 50 ft., pinned-leg viaduct spans, reaching to the Vermont abutment.

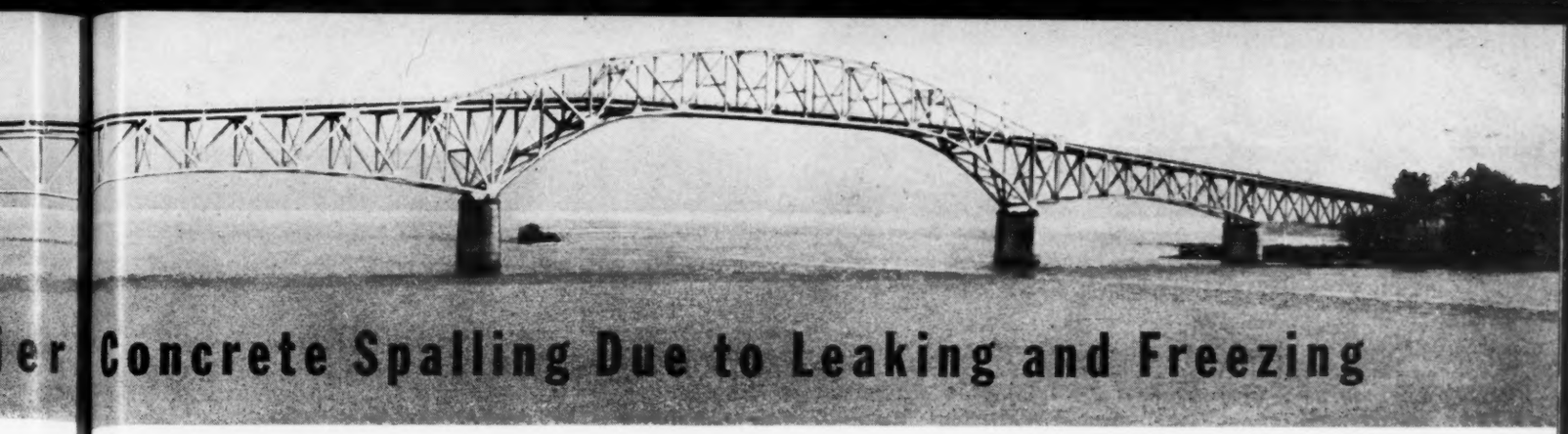
The viaduct legs and the deck approach trusses are spaced 18 ft. on centers, with the anchor and main span trusses being on 30-ft. centers. The deck consists of a 24-ft. concrete roadway with double curbs and sidewalks.

An examination of Figs. 1, 2, 3 and 6, will show the conditions in the upper sections of the concrete piers that were common, in varying degree, to all the seven principal piers in the structure. Water had been im-

Fig. 1 . . . FROST ACTION cracks loose large area of concrete near top of pier (below). Loosened concrete is 6 ft. high and 3 ft. wide.

Fig. 2 . . . EXPOSURE OF REINFORCING BARS (below) results from spalling off of 3 sq. ft. of concrete. Water exits are marked by efflorescence.

Fig. 3 . . . WIDE DISPERSION of points of egress of water is indicated (below), as compared with size of bearing above coping edge. This phase precedes spalling.



Concrete Spalling Due to Leaking and Freezing

LAKE CHAMPLAIN BRIDGE, 2,200 ft. long, is carried by seven principal concrete piers whose caps were being damaged by freezing water within bearings.

pounded within the bearing details, had run down into the anchor bolt sleeves, frozen, and was disintegrating the concrete in the pier caps in the vicinity of the bearings. These conditions, if not arrested, would obviously proceed to destroy the tops of the piers and lead to failure of the structure.

The channel piers rise nearly 40 ft. above the water through which they extend 20 ft. to lake bed, continuing down through 70 ft. of mud to rock some 130 ft. below the bridge seat. The other piers are similarly founded, but are increasingly shorter nearer the shores. No gamble with their security could be considered. The condition had been recognized by the designers some years before and some corrective measures were taken, but were not effective, as they were not directed at removing the cause.

Corrective Measures Devised — Fully corrective measures were promptly devised under the direction

Fig. 4 . . . RESOURCEFUL MECHANICS who applied corrective measures to bridge pier bearings are OLLIE D. CURRIER (left) and LESTER MOORE.

Fig. 5 . . . MACHINE SHOP of O. D. Currier's local garage (below) which was called upon to serve bridge repair project.

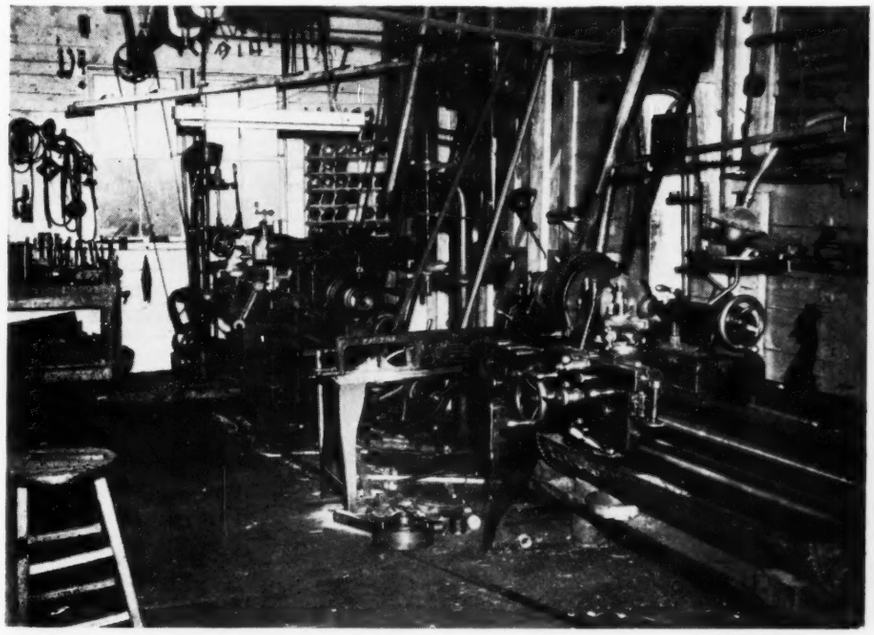


Fig. 6 . . . TYPE OF BEARINGS (below) are shown in this view looking down on pier cap.

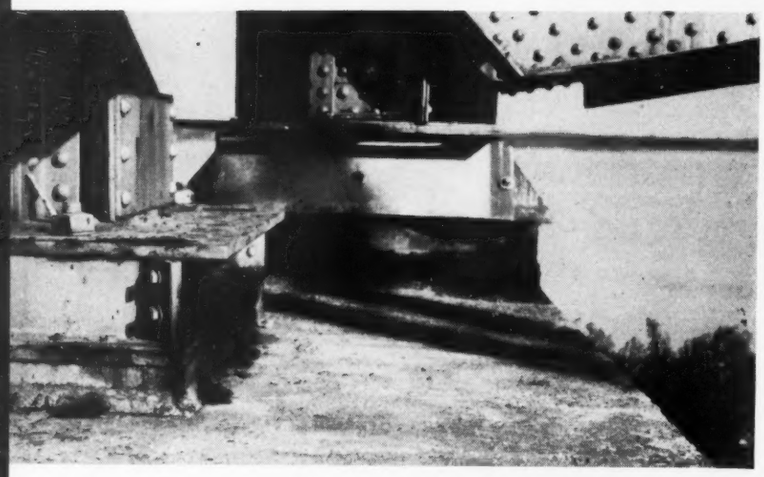


Fig. 7 . . . TYPICAL BEARING DETAILS are shown at expansion ends of trusses. Rain shield on far bearing was ineffective in excluding water from nest.

Fig. 8 . . . ONE SIDE OF GREASE BOX has been removed from bearing, with rain shield, shown in Fig. 7. Water still drains out and runs over lead gasket at center of photo.

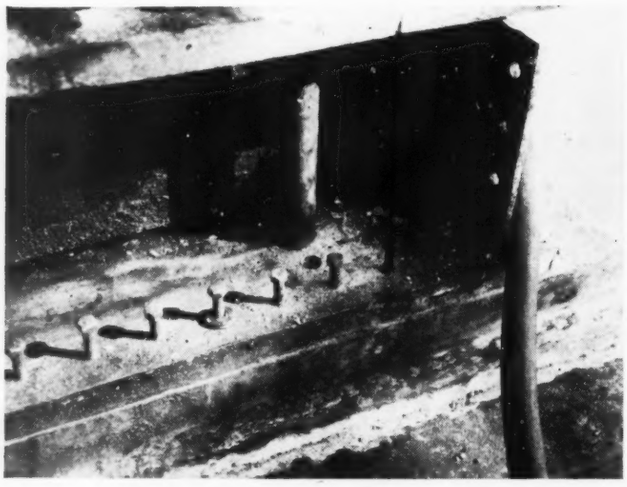


Fig. 9 . . . SIDE PLATE of grease box has been removed from segmented roller nest. "Soup hole" has been drilled alongside anchor bolt, ready for calking and grouting operations.

of E. W. Wendell, deputy chief engineer, New York State Department of Public Works, in response to a request for technical aid by the Bridge Commission. Acting in close cooperation with Marion L. Thomas, treasurer and acting superintendent of maintenance for the commission, procedures were developed which would involve the minimum of disturbance to the structure, and which, it might reasonably be expected, could be concluded despite the extremely critical, war-time limitations on man-power, materials and equipment.

In the design of the bearings reliance had been placed upon the Albany grease, with which the rocker and roller nests were packed and surrounded to seal off the anchor bolt sleeves against the penetration of water below the bridge seats. It did not work. Numerous other details conspired to aggravate this condition as well as cause troubles of their own. It is felt that a tedious description of each and every bearing would

(Continued on page 167)

Fig. 10 . . . ROLLER NEST (below) has been displaced to rear. Note bent anchor bolts and side guide bars riveted to base plate behind grease box studs. Front grease box plate is still in place.

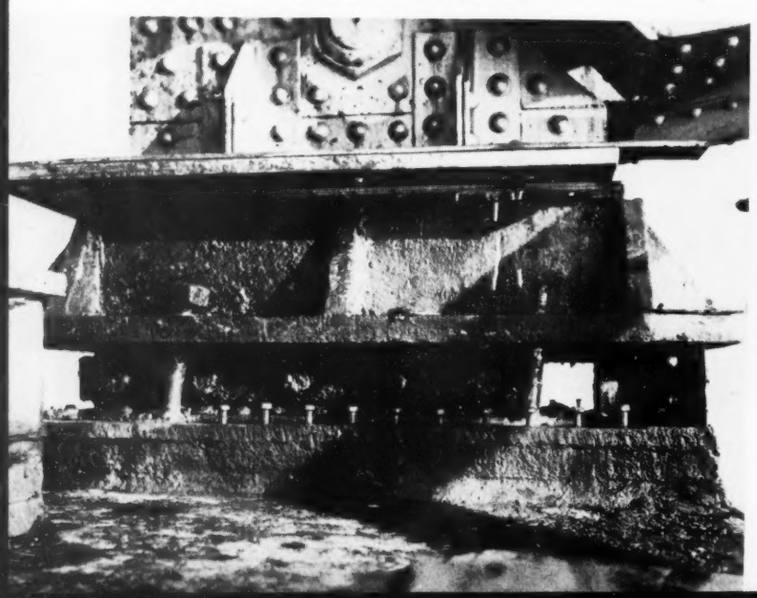
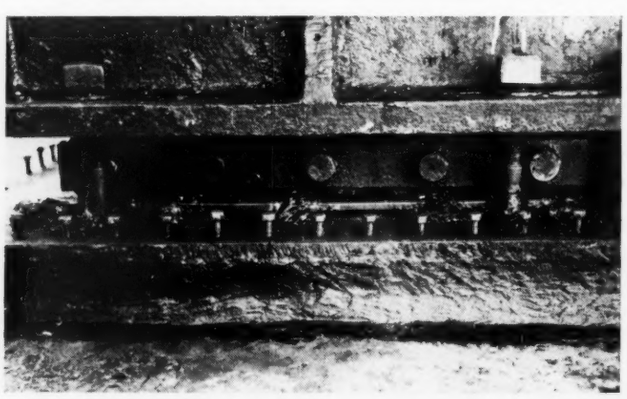


Fig. 11 . . . ROLLER NEST (below) of bearing in Fig. 10 has been reset, sealing completed, grease and boxes removed, guide bars raised on scupper blocks and cap screws set in calking compound. Round washers were welded to anchor bolt nuts.



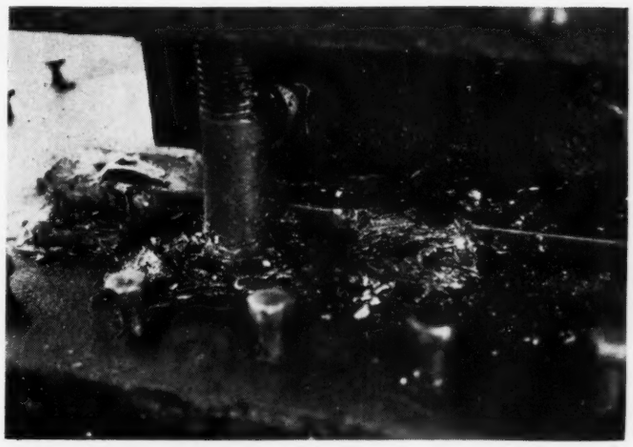


Fig. 12 . . . ANCHOR BOLT in Fig. 11 receives application of rust-inhibitor grease to weld on seals and on side bar scupper blocks.

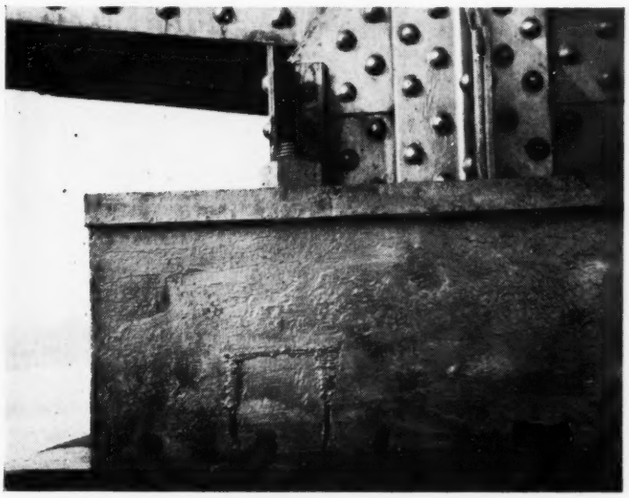


Fig. 13 . . . FIXED BEARING is completed except for welding on sealing bars over temporary drain holes shown in bottom edge of casting. Note replaced cut-out window in line of anchor bolt that gave access to base plate for drilling, grouting and calking that sealed pipe sleeve below.

Fig. 14 . . . APPLE-PICKER'S LADDER (below) is hooked to pier ladder to provide access from lake surface.

HAMILTON PENN

Ex-President of AED

Dies in Chicago

HAMILTON O. PENN, 49, president of the H. O. Penn Machinery Co., Inc., of New York, and retiring president of the Associated Equipment Distributors, died suddenly in Chicago Jan. 31 while attending the 27th annual AED convention.

Mr. Penn's company which he founded in 1923, is distributor for many lines of heavy construction equipment. In addition to the main

HAMILTON O. PENN

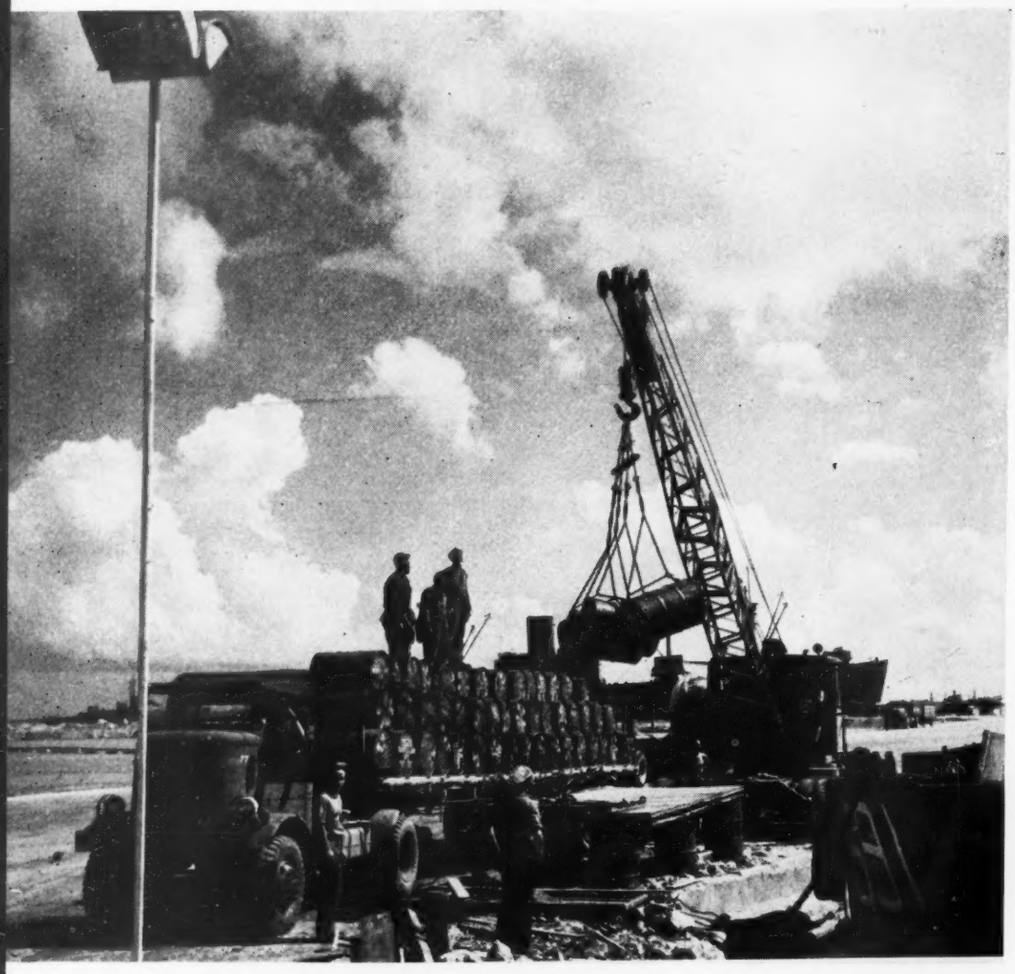
plant in the Bronx, branch sales offices and service shops were established at Mineola, L. I., Poughkeepsie, N. Y., and Newington, Conn. For a time he owned the Michigan Tractor & Equipment Co. and at his death was an officer of Tyson Roller Bearing Co., Massillon, Ohio.

During the early stages of the war, "Ham" Penn was called to Washington as chief of the used construction machinery and track-type tractor sections of the War Production Board.

Born in Hartland, Wis., and graduated from the Milwaukee State Normal School, he was a construction superintendent before entering the manufacturing field as assistant sales manager of the T. L. Smith Co., concrete mixer manufacturers, of Milwaukee.

Widely known throughout the construction industry and active in civic and business affairs, Mr. Penn was a director of the Bronx County Trust Co. and a trustee and program committee chairman of The Moles, New York organization of tunnel and heavy construction men.

SEABEES WORK WONDERS WITH EMPTY OIL DRUMS

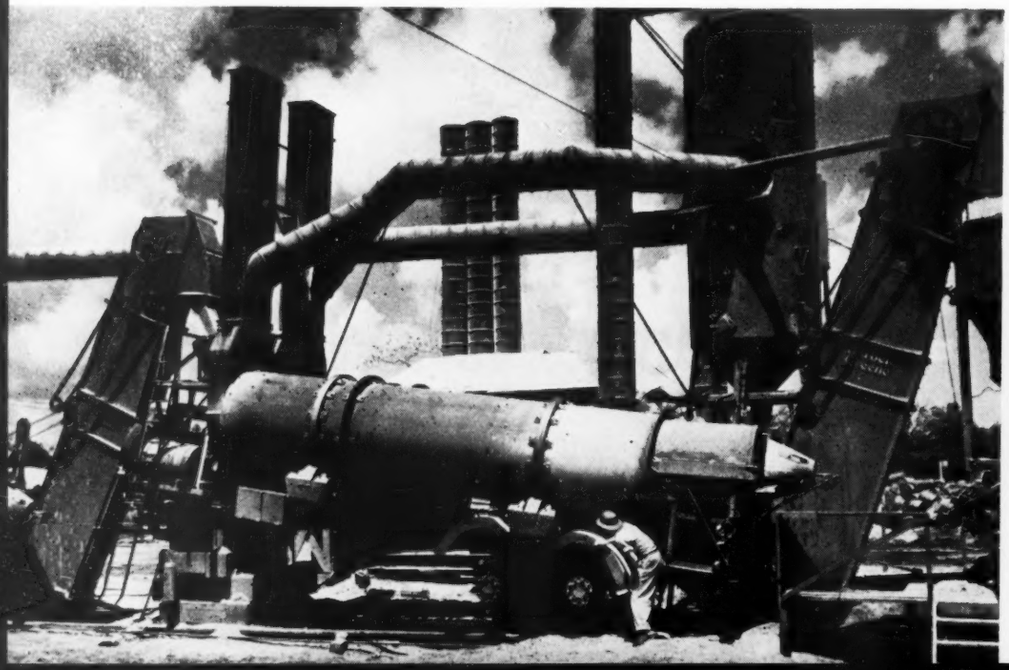


EMPTY STEEL OIL DRUMS, which become construction material in hands of Seabees, are loaded on to trucks at salvage dump to be adapted to wide range of uses. Note even flood light reflectors in upper left foreground are painted split drums mounted on pipe poles.

STEEL OIL DRUMS may be simple containers to most of the world, but in the hands of the ingenious Navy Seabees they become a versatile construction material. The accompanying pictures, taken on Guam, show some of the ways in which the empty steel barrels are put to use. Such use is not a waste of drums, but is a clever adaptation of material at hand when orthodox materials are lacking in the rush of war in the forward areas.

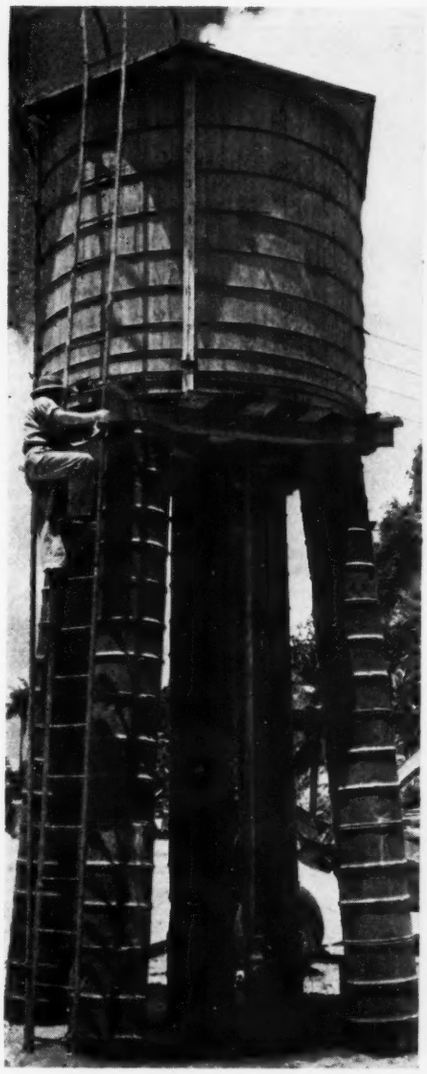
These views show only a few of the uses the Seabees find for empty oil drums. They also are perforated and buried as temporary septic tanks and converted to showers, water heaters, and wind-driven washing machines. They show up in rafts, floats, small barges, channel markers and small craft moorings. Revetments, gun emplacements and air raid shelters have been built up with the versatile drums. In fact, in traveling around Guam one wonders how the war could have been won without empty steel drums.

STACKS AND PIPING (below) for home-made asphalt plant are made out of headless drums welded together.

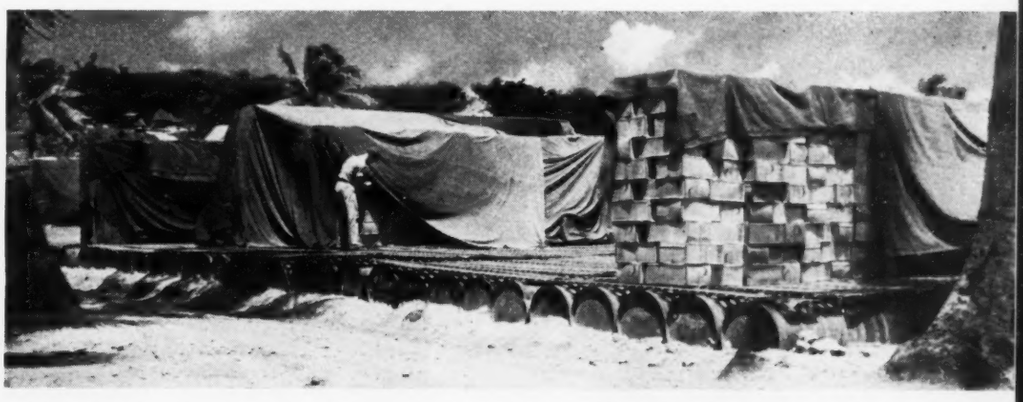


TERMITES can't damage these half-drum supports (below) under big Quonset hut.

NOT A FANCY FILLING STATION, but this portable fuel tank, made up of several drums welded together, services automotive equipment in field.



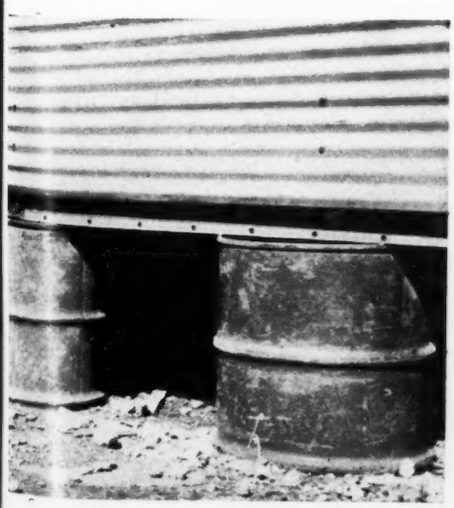
FIVE-LEGGED TOWER of welded drums carries wood water tank high enough to provide necessary pressure for distribution throughout camp area.

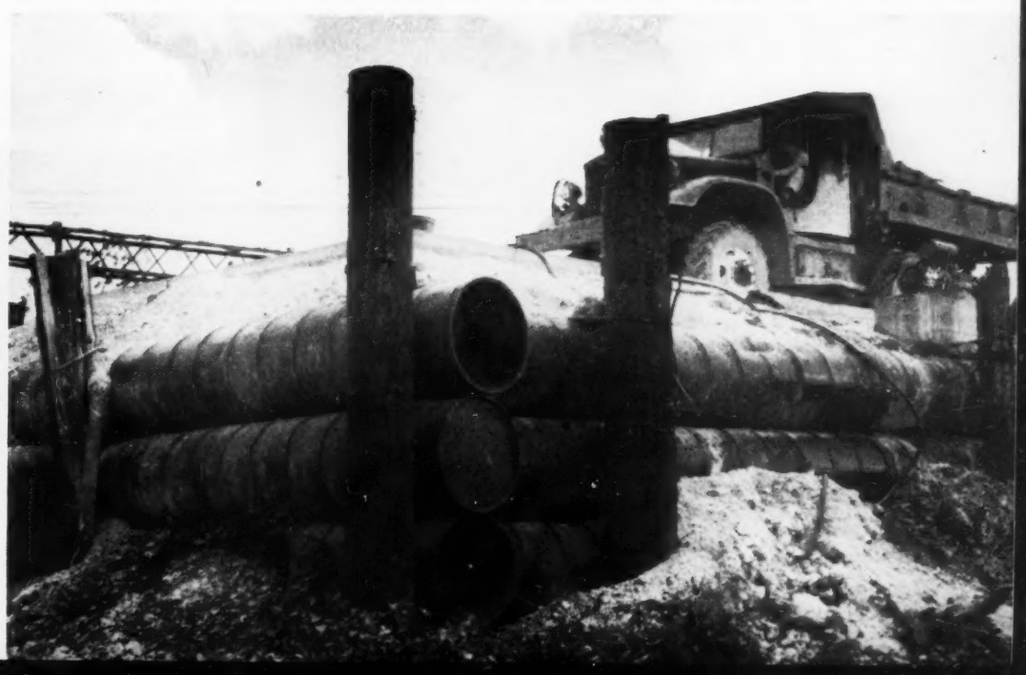


HARDSTANDS to keep supplies off ground are formed of drums topped with steel airfield runway mats.

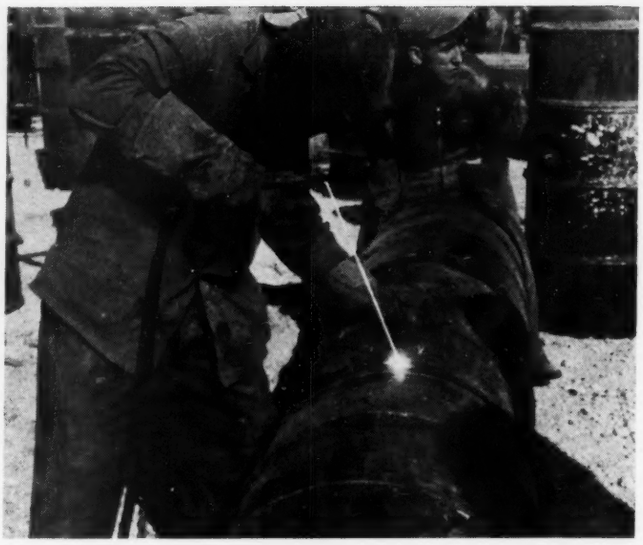
All photos by Morris Monts De Oca, Official Seabee Photographer

GRILLAGE OF DRUMS (below) makes satisfactory truck greasing and servicing rack.





DRUM HEADS are not wasted, but are cut up into attractive steel signs for use as highway markers.



STRINGS OF CULVERT PIPE are fabricated by spot welding open drums end to end.

EMPTY OIL DRUMS

(Continued)

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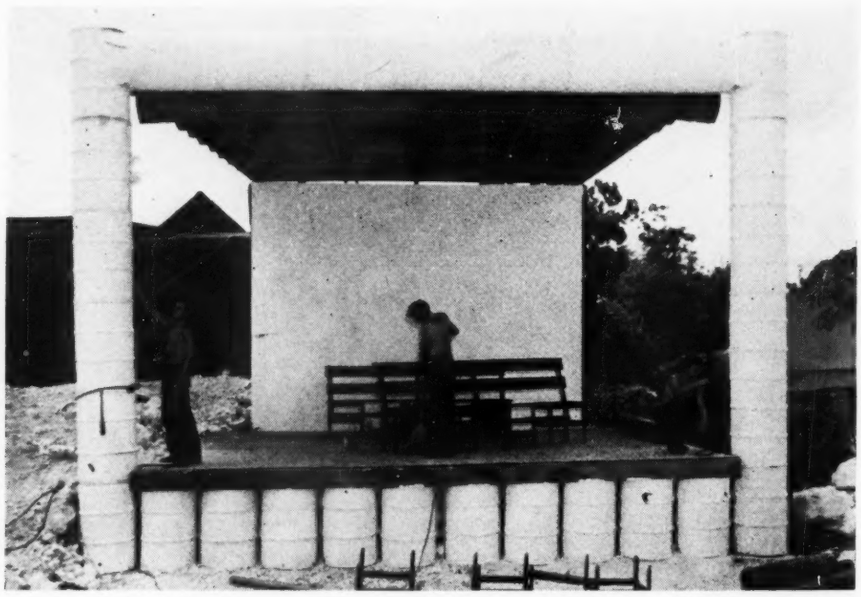
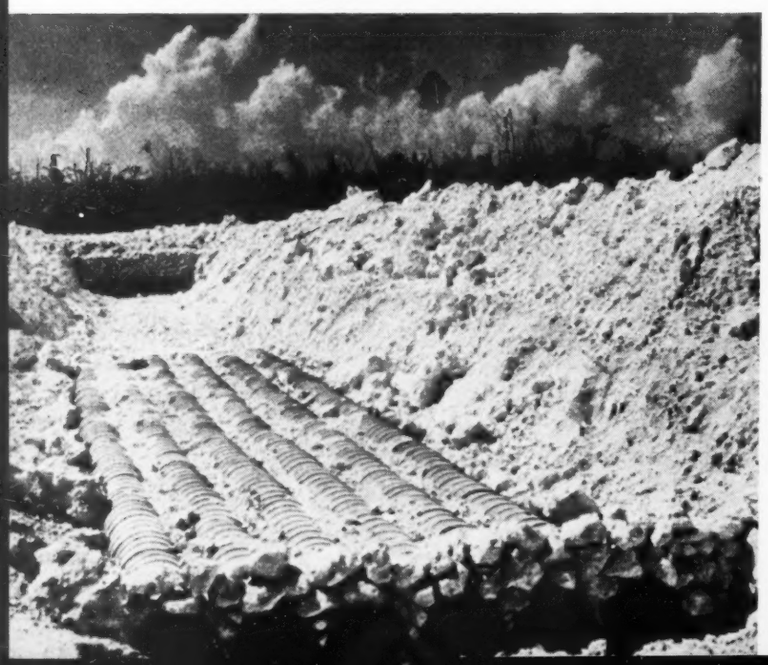
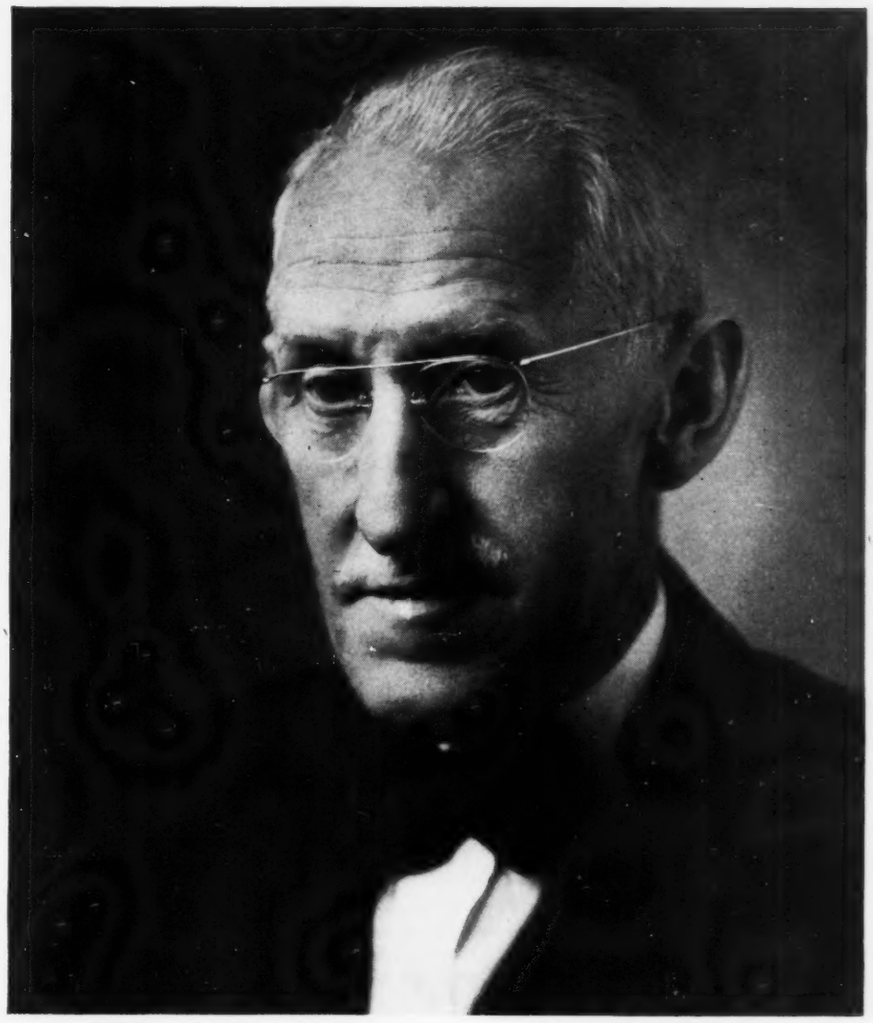
FRONT LINE AIRFIELDS (below) must be drained and strings of headless drums welded end to end make satisfactory culvert under adjacent runways.



PROSCENIUM ARCH of battalion theater is framed from welded drums, while stage is carried on drum foundations.



AS SANITARY FIXTURES (below) oil drums go highbrow when welding and cutting torches make toilets out of them.



EDWARD P. PALMER

A SOFT-SPOKEN FELLOW who invariably talks sense is Edward P. Palmer, president of Senior & Palmer, Inc., New York foundation contractors. Ed Palmer has been talking sense for a long time and the world has been listening and learning. Way back in the NRA days of 1933 he started his extra-curricular services to the construction industry by serving as a member of the Construction Code Authority. The code fizzled out, but Ed Palmer didn't. He went on to become vice-president of the Associated General Contractors of America, and then was elected president for 1938.

Recognizing that Ed's forte was in the field of labor relations, his fellow contractors in AGC named him as head of the association's Labor Relations Committee in 1939, and he carried out this assignment so successfully that he could not get rid of the job until 1945. One of his notable contributions to construction labor peace was the suspension of 300 jurisdictional strikes in the building trades in August, 1939.

Busy as he was, Ed Palmer served as active director of the Chamber of Commerce of the United States from 1939 to 1945, and headed up that organization's Committee on Construction and Civic Development. During this period he promoted the worthwhile Construction Industry Conferences each year until they were terminated by the war. Then he became a member of the Advisory Committee to the Army and Navy Munitions Board.

In addition to all these outside activities, Ed has been a successful contractor for many years. He deserted his native state of Pennsylvania after graduating from Swarthmore College in 1906 and came to New York, the scene of most of his construction life.

After eight years as an engineer on several large projects, he switched to contracting to join the old Rapid Transit Subway Const. Co. as superintendent. He has been in contracting ever since, with the exception of two years in France as a captain in the Transportation Corps in World War I.

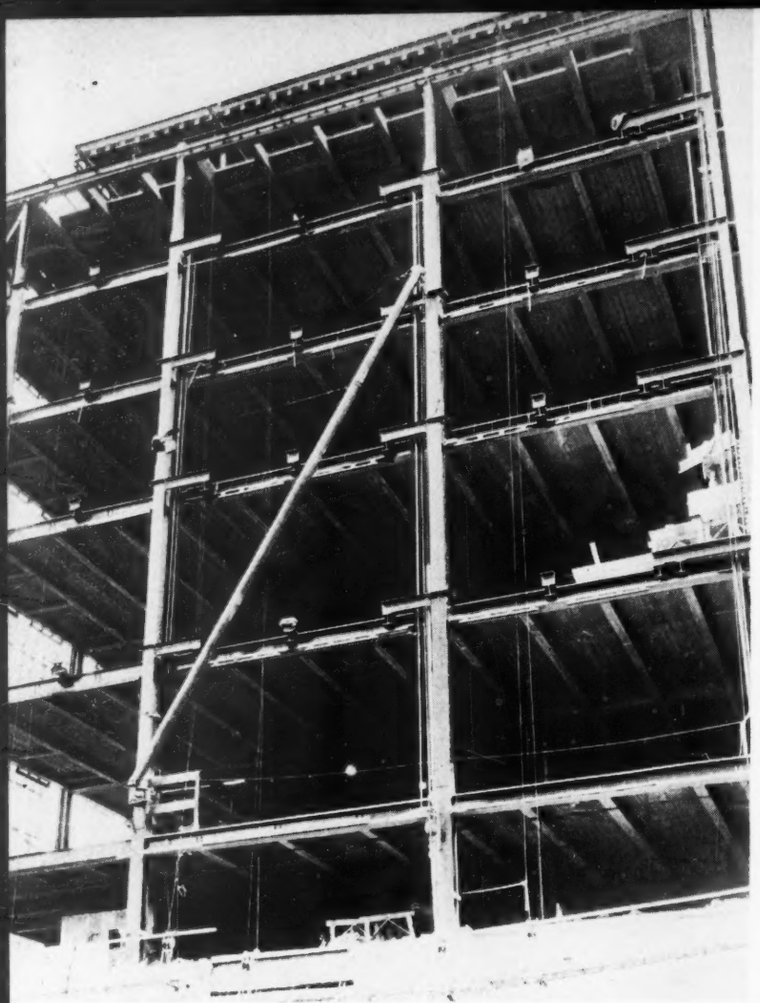
In 1929, after eight years with the Arthur McMullen Co., Ed went into business for himself along with the late Frank S. Senior, another McMullen alumnus. The roster of jobs Senior & Palmer has built reads like the construction history of the New York area. Subways, tunnels, bridges, and difficult foundations are on that list. During the last war they built big Pine Camp and the Scotia Naval Storage Depot in upstate New York in association with the John W. Cowper Co. of Buffalo.

Ed also finds time to serve on the Board of Trustees of Swarthmore, as a trustee of the Seabury Memorial Home at Mt. Vernon, N. Y., and as an active member of the ASCE.

The construction industry is a better industry today because of Ed Palmer and his habit of always talking sense.

Aluminum-Treated Concrete Cuts Building Costs

By JOHN G. WURTZ, Jr.
Aluminum Company of America



LIGHT-WEIGHT EXPANDED CONCRETE in floors, roofs and wall partitions permits substantial saving in cost of structural steel in tall buildings. Concrete weighing but 108 lb. per cu. ft. is used as floor fill in Tiffany & Co. Building, New York (above and apartment house in New York (right).

EXPANDED CONCRETE FILL BETWEEN SLEEPERS (below) in floors of Bamberger Building in Newark, N. J. is light-weight material with good fire-resisting and sound-insulating properties. Expanded concrete is either field cast in place or used as precast slabs.

THE REVIVAL OF BUILDING in this country focuses attention on materials offering possibilities of lower costs. One such material is expanded, or aerated, concrete made by mixing aluminum powder with cement, sand and water. This light-weight, fire resistant building material has been used successfully over the last 25 yr., primarily for floor fill and wall partitions in office buildings, department stores, hotels, small homes and farm buildings.

The concrete is made to expand by adding aluminum powder to the mix. Reaction of the aluminum powder and cement produces a gas which causes the mix to expand in much the same manner as bread dough rises from the action of yeast. Resistance to fire, sound deadening ability, good heat-insulating characteristics and its principal prop-

TABLE I.—COMPARATIVE WEIGHTS AND THERMAL CONDUCTIVITIES

Material	*Weight in lb. per cu. ft.*	*Thermal conductivity*	*Equivalent thickness in inches*
Corkboard	10	0.30	1.00**
Aerated Concrete***	30	0.69	2.30*
Aerated Concrete	40	1.06	3.54*
Aerated Concrete	50	1.44	4.80*
Aerated Concrete	60	1.80	6.00*
Aerated Concrete	70	2.18	7.27*
Dry Brick Work	132	4.00	13.33****
Concrete	140	8.30	27.70****

*Peebles, Armour Institute **Bureau of Standards ***Aerated Concrete made by Aerocrete Corporation of America **** Willard, Lighty and Harding

TABLE II.

General Formula		*Laboratory Formula*
Portland Cement	1 sack	6 lb.
Sand	0 to 3 cu. ft.	17 lb.
Water	6½ to 8½ gal.	1½ qt.
100-Mesh Aluminum Powder	3¼ to 4 oz.	¼ oz.

EVEN TEXTURE AND CELLULAR STRUCTURE of expanded concrete is produced by gas generated when aluminum powder is added to high water-cement ratio mix. Action is similar and texture is comparable to that produced by yeast in forming cells in bread.

erty, lightweight, make expanded concrete a desirable building material when its weight-strength ratio is satisfactory.

Ordinary concrete weighs about 150 lb. per cu. ft. By varying proportions of the ingredients, expanded concrete can be produced in weights ranging from 50 to 110 lb. per cu. ft. Used in large buildings for roof construction, floor fill, and wall partitions, the lightweight concrete makes possible a substantial saving in the amount of structural steel needed for the frame.

Good Insulating Properties—Fire-resistant properties of expanded concrete make it an effective material in "fire-proof" construction. In one test, conducted by Columbia University for Aerocrete Corporation of America, the lower flanges of steel beams, protected by 2 in. of 60-lb. expanded concrete, were exposed to fire on three sides. Although the heat of exposure during the 4-hr. test averaged above 1,700 deg. F., the temperature of the steel protected by the expanded concrete increased less than 200 deg.—from 47 to 221 deg. F. Such protection is important because fire damage to

(Continued on page 158)

Fancy Structure for Throwing the Bull

Photo Press Association, Inc.

MEXICAN CONTRACTORS completed the world's largest bull ring at Mexico City just in time for a big dedication performance on Feb. 5 featuring Manolete, famed Spanish matador. The odd structure, seating 47,000, is an inverted truncated cone, 131 ft. high of which the lower half extends down below street level. Earth in the center core was hollowed out to accommodate the arena. The excavation sidewalls were left standing to support the seats, ramps and superstructure, which is reinforced concrete. Concentric around the center core are subsurface stables and corrals for horses and bulls used in the shows.

NIGHT OPERATION under lights from three movable towers increases output by ten units of big Le Tourneau scrapers hauled by Caterpillar tractors to average of 70,000 cu.yd. per week. Heavy soil prohibits heaped loading because of cable breakage.

Tractor–Scraper

Operation Speeds Work on Highway and Drainage Ditch

TEN WELL-MANNED and well-managed Caterpillar-Le Tourneau tractor-scraper units working two 11½-hr. shifts per day averaged 70,000 cu.yd. per week last fall in moving earth from adjacent drainage ditches into roadway embankment on a combination project built for the Minnesota State Highway Department by Megarry Bros., contractors, St. Cloud, Minn. By combining 13.7 mi. of work on U.S. 75 and intersecting State Trunk Highway 55, north of Wheaton, with some 10¼ mi. of excavation for ditches adjacent and generally parallel to the roads, both the State Highway Department and the local drainage district saved money. Earthmoving quantities for the interdependent contracts, which could be bid only in combination, totaled 570,000 cu.yd. Hauls were short, generally 200 to 500 ft., except for one 80,000-yd. balance at the junction of the two highways, involving 40 percent long-haul work to a maximum of 1¼ mi., and the contractor was able to complete the 570,000 yd. of grading in 3½ weeks of single-shift and 7 weeks of double-shift operation.

Drainage ditches are necessary in this fertile prairie plateau at the headwaters of streams flowing north and south. The drainage contract included additional yardage for laterals excavated under district supervision, and not under supervision of the highway department. On the combination project, engineering costs of the highway department were apportioned 70 percent to the road work and 30 percent to the ditches, which required less inspection. The highway contract called for graveling 30 ft. wide, 1,200 yd. to the mile. On U.S. 75, this surface was supplied by salvaging existing gravel and bituminous mat, which was crushed and screened for re-use.

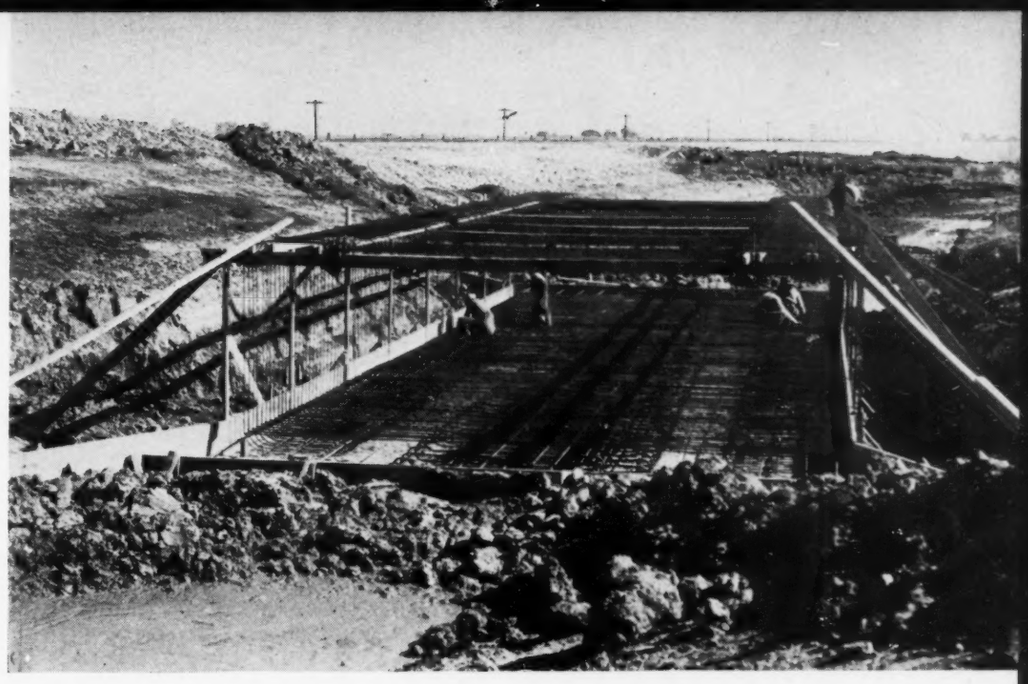
Width of roadbed, shoulder line to shoulder line, is 43.2 ft. on U.S. 75 and 38 ft. 8 in. on Trunk Highway 55, with a crown slope of 1/3 in. per ft. both ways from the center line. The contract involved 5.8 mi. on U.S. 75, south of the junction, and 7.9 mi. on No. 55. Drainage ditch, parallel to one side of each road and

DRAINAGE DITCH EXCAVATION provides embankment material for adjacent highway. Loaded tractor-scrapers sometimes require pusher help in climbing 25 percent grade out of deep ditch. Scrapers dress slopes.

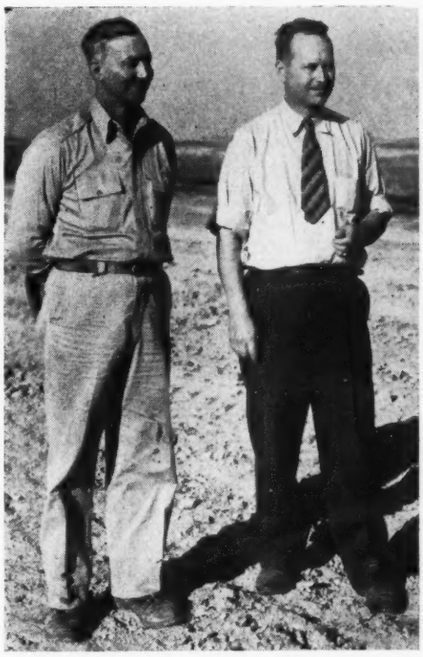
adjacent to the shoulder, has an inner slope of 1 on 4 and an outer slope of 1 on 3. Depth of the drainage ditch varies to a maximum of about 12 ft. The highway department pays for all work within 50 ft. of the center line, and the remainder is paid for by the drainage district. Megarry Bros.' highway contract, based on estimated quantities, totaled less than $77,000 and amounted to about 30 percent of the total cost for road and adjacent ditch. In the highway contract, 140,000 cu.yd. of excavation was priced at 18c. The remaining 430,000 yd. of the combination project appeared in the drainage ditch contract.

Specifications set Aug. 1, 1946, as the completion date for all work and provided originally that no

(Continued on page 148)



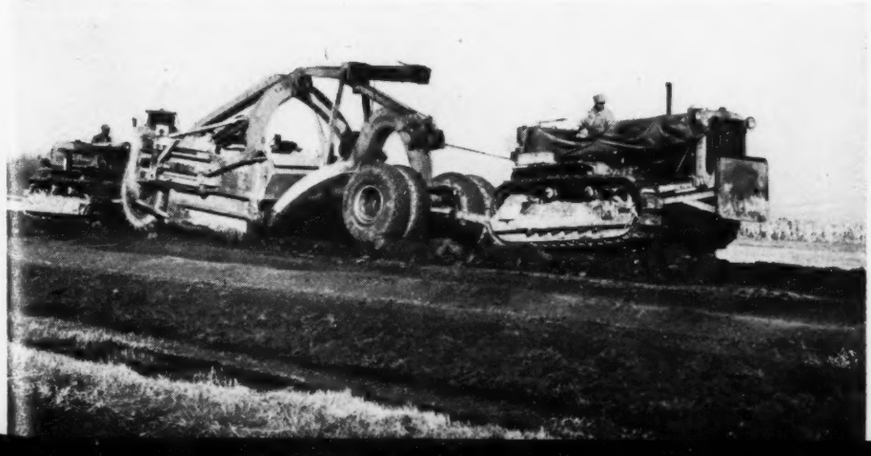
RIGID-FRAME CULVERT comprising double boxes each 10 ft. wide by 6 ft. high passes drainage ditch under U.S. 75 at junction with Trunk Highway 55. Drainage structures on combined ditch-and-highway project are built by Zontelli-Herbison, Inc., Ironton, Minn.



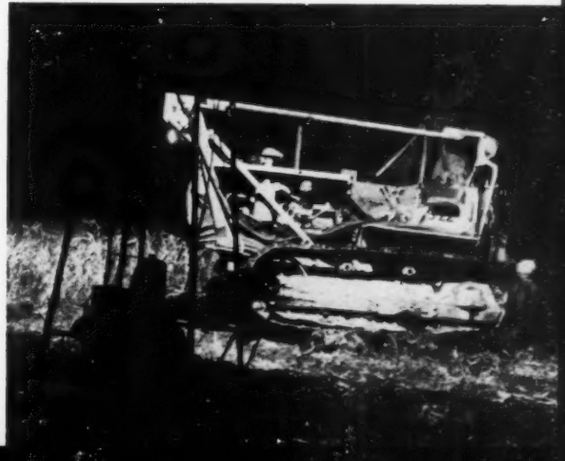
JOB OPERATIONS of Megarry Bros., contractors, are managed by **JACK RUCKER** (left), superintendent, standing beside **DEWEY F. MATTSON**, assistant construction engineer, Minnesota State Highway Department.

THREE-SECTION SHEEPSFOOT ROLLER compacts fill layer on road while Le Tourneau scraper cuts highway ditch alongside embankment.

SCARIFIED BITUMINOUS MAT (below) on U.S. 75 is salvaged by pusher-loading into 23-yd. scraper for delivery to job crushing and screening plant, where material will be sized for re-use in graveling regraded highway.



LIGHT PLANT (below) silhouetted at base of portable tower furnishes power to illuminate night maintenance work on tractor.



MODIFIED FOR EARTH HAULING, this International ID-9 wheel tractor is equipped by M-R-S Mfg. Co. with hydraulic ram that brings weight of Mississippi wagon to bear on tractor rear wheels when hard pull is encountered.

SHANK EXTENSIONS on Bonney ratchet-handle socket wrench enable workmen to tighten nut on anchor bolt of trash-rack beam in Mill Creek pumping station of Cincinnati flood-control project being built by Ferd J. Robers Construction Co. and La Crosse Dredging Corp., Minneapolis, for U. S. Engineers.

HOW *They Did It*

CONSTRUCTION DETAILS *For Superintendents and Foremen*

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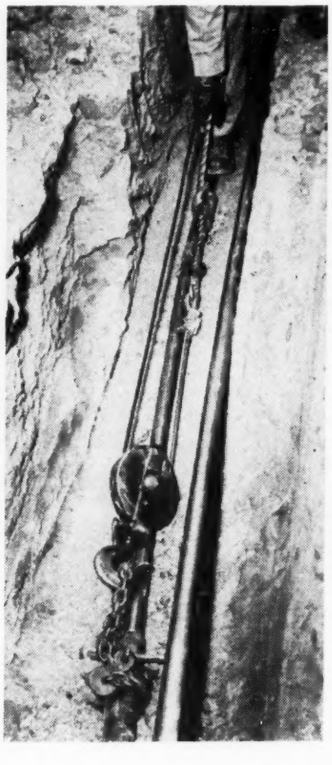

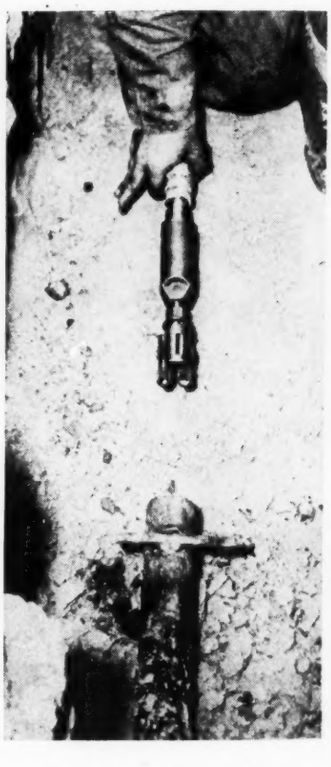

HEAVY 48-IN. CONCRETE PIPE (below) is scooped up and lowered into place by Caterpillar diesel tractor equipped with Trackson Traxcavator on storm sewer project of Moore Engineering Co., Mt. Vernon, Ill.

WORN-OUT GAS MAIN is relined by forcing 1⅞-in. outer-dia. copper tubing (left) through 2⅛-in. inner-dia. pipe by system of pulleys and cables attached to air-driven power winch. Scale, rust and welding burrs which impede progress of tubing are removed from inside of 20-year-old pipe by use of Elliott-Lagonda air-driven motor (right) fitted with cutting head. Motor is attached to ¾-in. nipple brazed to end of tubing. Air for driving cutter is supplied by truck-mounted compressor through copper tubing instead of through conventional air base.

PNEUMATIC TIRES cushion 36-in. Goodyear conveyor belt which hauls 450 tons of coal, rock and shale per hr. from Shenandoah, Pa., mines. Six-ply tires, mounted on shafts revolving in bearings, are placed at dumping point to absorb shock of falling material.

BENCH DRILL STAND mounts ¾-in. Van Dorn electric drill equipped with special routing tool to cut grooves for ring shear plate connectors in triangular pieces to be used in timber crane-way structure.

TRUCK-MIXER DELIVERS CONCRETE to bottom-dump bucket which is picked up by Bucyrus-Erie crawler crane and lowered to point of discharge over forms of Olmstead Siphon, Provo Reservoir Canal, in Utah.

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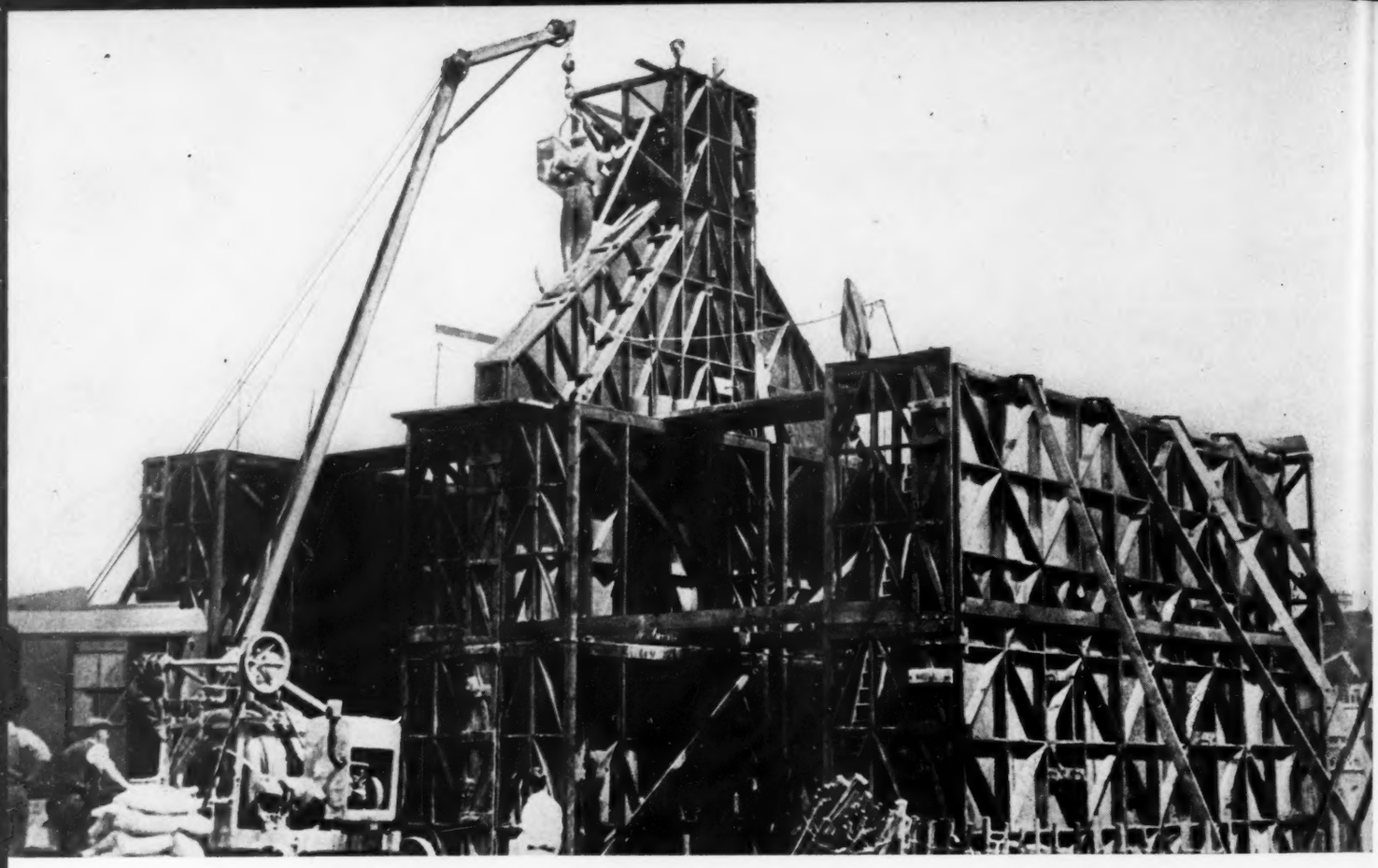
OPEN-TYPE BRIDGE RAILINGS (below) permit unobstructed view from Franklin D. Roosevelt Memorial Bridge, recently completed over Washita River arm of Denison Reservoir, near Durant, Okla. Railings were fabricated by U-bolting straight runs of 3½- and 4-in. Byers wrought-iron pipe to upright beams which, in turn, were connected to trusses supporting deck. Built under U. S. Engineer Corps supervision, bridge was designed by Sverdrup & Parcel, of St. Louis, Mo.



REMOVABLE WOOD FORMS erected and dismantled by crane are used in pouring 12-in. concrete walls of two-family houses in Great Britain. Forms locate exact positions of windows, doors and ducts for pipes and cables.

FORM IS REMOVED FROM BACK WALL of house (below) in one operation, transported to new site and reused on house of same basic design. Walls of 12-in. cellular concrete make damp-proof, well-insulated houses.

Big, Movable Forms Used for British Housing

BASED ON THE PREMISE that permanent housing should be built of quickly applied, inexpensive materials of proved durability, requiring a minimum of skilled labor, George Wimpey, British engineer developed a two-family dwelling with 12-in. concrete walls poured with specially designed, large removable forms.

Use of large-scale formwork on the interior of the house is possible because of an open-front design, which permits withdrawal of the units intact. Poured-wall construction is possible because of the form design which carries carefully located inserts for windows, doors and other openings. Precise positions for pipes

and ducts are also provided by the formwork.

Cranes Handle Large Forms—Side, back and party walls of the Wimpey house, poured in 8-ft. lifts, are of expanded concrete to provide a damp-proof well-insulated dwelling. As cranes handle the formwork, units as large as the complete side of a house can be placed in position or removed in one operation.

Although the Wimpey design does not adopt prefabrication methods for constructing outside walls and roof, production line methods are used in preparing roof timbers and floor joists. These parts are cut and trimmed, ready for assembly upon arrival at the building site.

Front Designs Vary—Variations in architectural treatments of the brick fronts give individuality in appearance. In a standard brick-faced house, because of the large areas needed for front windows and door openings only 13 per cent of the brick work is in the front wall. Thus, by using brick facing for the Wimpey-type house, much skilled bricklaying is eliminated.

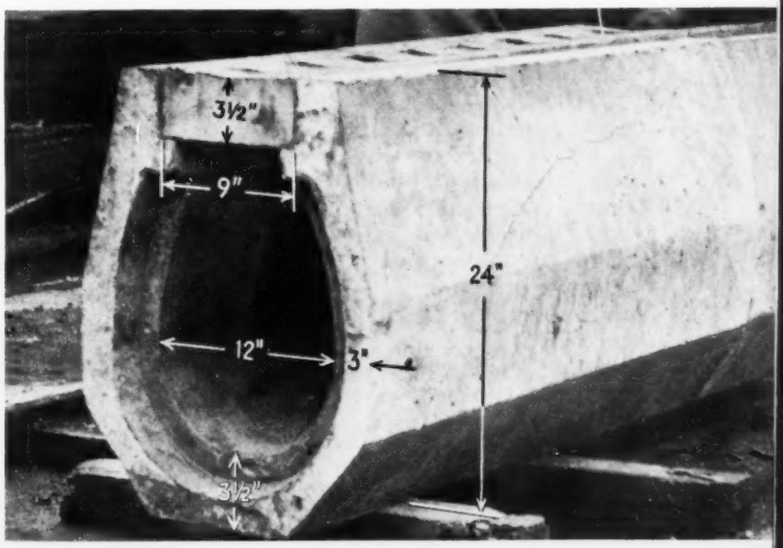
The overall size of the house has been held to reasonable proportions to keep costs moderate.

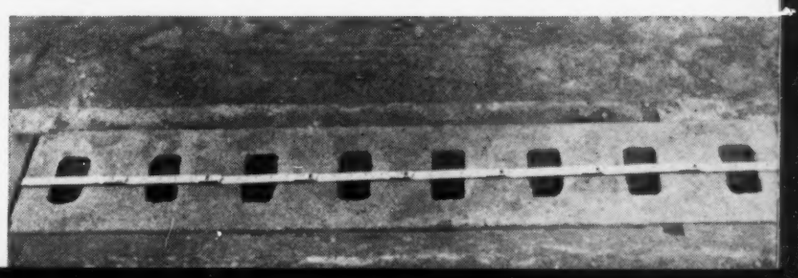
TILE ROOFS ARE CONSTRUCTED immediately after wall forms are removed to provide shelter for finishing interiors of houses and for storing building materials. Variations in treatment of brick fronts give houses individuality.

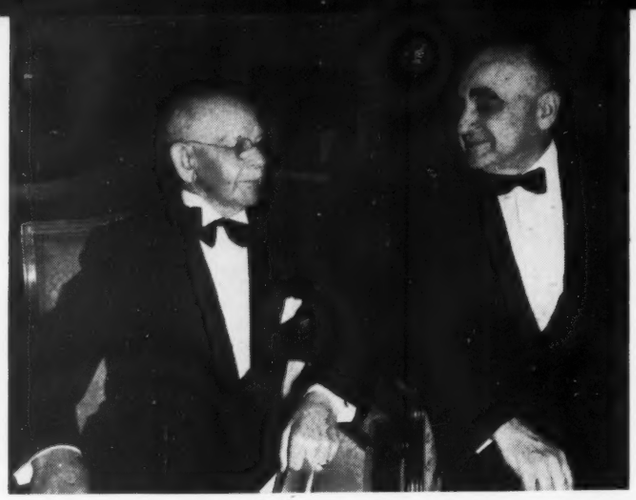
PRECAST U-BOX SECTIONS DRAIN AIRPORT

A NEW TYPE OF BOX DRAIN set flush with the runway level has been installed at the Parkersburg, W. Va., airport. The drain consists of series of precast reinforced concrete two-piece sections, 4 ft. long. The main box section is U-shaped, with a flat outside bottom and curved inside flow line, 24 in. high, with 3-in. sidewalls and tongue-and-groove end joints. Resting on shoulders cast at the top of the U-section is a disked slotted inlet slab, 3½ in. thick and 9 in. wide. Top units can be lifted off for inspecting and cleaning the drain.

Set flush with the ground the conduit offers no obstruction to flight operations. The drain was installed by Meyers-Western Grading Co. for the Civil Aeronautics Administration, from a design developed by Herman G. Moselowitz, of New Brunswick, N. J.







CONSTRUCTION VETERANS O. W. SWENSON (left) and MILES I. KILLMER medal recipients, talk over old times at The Moles award dinner.

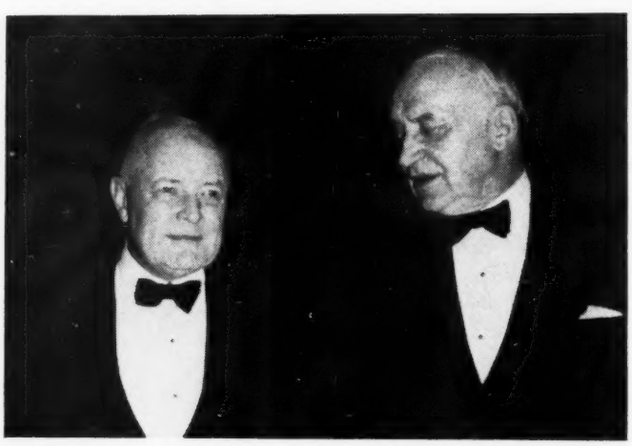
DISTINGUISHED GUESTS at the dinner included Vice Admiral BEN MOREELL (left), 1943 award winner, and Maj. Gen. LESLIE R. GROVES, U. S. Engineers, of atomic bomb fame.

MOLES PAY TRIBUTE TO TWO VETERAN CONTRACTORS

BEFORE AN AUDIENCE of 700 fellow contractors and engineers attending a dinner in their honor in New York, Feb. 6, Oscar W. Swenson and Miles I. Killmer, old-time construction men, received the Moles annual award for "outstanding contributions to construction progress." Presented by Edmund A. Prentis, Mr. Swenson, 81-year-old president of Foley Bros., Inc., briefly recalled his early construction days, contrasting the old methods and equipment with those of today.

"In my lifetime," he said upon receiving the award, "I have seen the use of hands of men and the power of horses changed to steam power, then to electric power, to the gasoline engine and finally to diesel. It may be that in the not-too-distant future the miraculous power of the atom will be available to us." He also commented on the fact that the construction pioneers struggled principally with logistics and raw nature, while today "while you grapple with the physical problems more quickly, you are saddled with man-made burdens the oldtimer never dreamed of. In addition to being a constructor you must be a banker, lawyer, tax expert, be conversant with thousands of union and government regulations and be able to furnish at a moment's notice, 20 copies of anything."

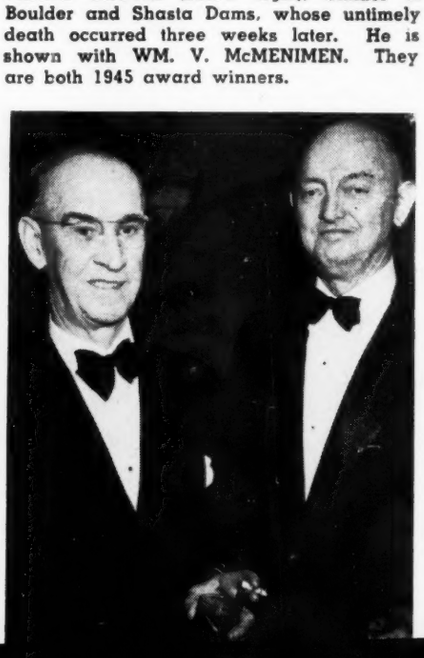
Killmer, pioneer tunnel driver who started out as a New York sandhog, and is now general superintendent for Mason & Hanger Co. was introduced by Howard King of his firm. He, likewise, reminisced about early construction days, remarking that the British workmen who came over here on the Pennsylvania R. R. tunnels "taught him a peculiar language that was of little use making a speech."



THOMAS A. SCOTT, (right) head of award selection committee, talks it over with ARTHUR A. JOHNSON, Moles president, who presented the medals.

MOLES TREASURER RALPH ATWATER (below), a charter member, arranged and managed the big dinner.

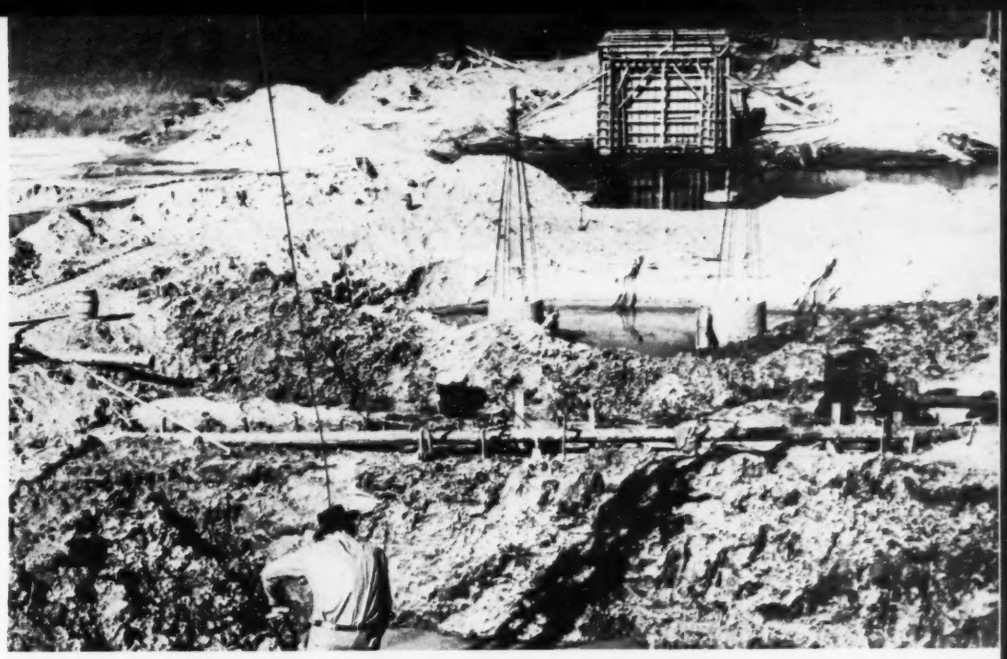
OUT OF THE WEST for the occasion came FRANK CROWE (below right), builder of Boulder and Shasta Dams, whose untimely death occurred three weeks later. He is shown with WM. V. McMENIMEN. They are both 1945 award winners.



Wellpoints Dry Excavation For Bridge Piers

By J. J. CORBETT

Engineer of Construction,
Missouri State Highway Department



TYPICAL WELLPOINT INSTALLATION included header pipe placed horizontally to form rectangle around bridge pier excavation to be dewatered.

COLLAPSE OF OLD BRIDGE, after severe flood had undermined abutment, necessitated building of new structure.

SIDES OF EXCAVATION dewatered by wellpoints stood up, with no cave-ins on slopes of 1 on 1.

WELLPOINTS MADE POSSIBLE excavation in the dry for the piers of a highway bridge built across the West Fork of the Grand River in Gentry County, Mo., to replace a 160-ft. steel truss which had collapsed after severe floods had undermined one of its abutments. By lowering the ground water level at the pier excavations the contractor, C. E. Maxwell & Son, of Columbus, Kan., was able to carry on the work without the use of sheetpiling or tremie concrete for the seal courses. The new bridge comprised I-beam spans of the following lengths and sequence: 39 ft., 60 ft., 70 ft., 70 ft., 60 ft., 39 ft.

Soundings at the bridge site indicated sand from streambed down to considerably below footing elevations, except for a stratum of impervious clay or gumbo averaging 2 ft. thick and located about 8 ft. below streambed. Plain timber piles, with tip elevations at least 30 ft. below the bottom of the anticipated seal courses, were to be driven under the pier footings. Seal course

(Continued on page 154)

PLACEMENT OF CONCRETE (below) for footings and piers followed piledriving.

Jeep Jumps Into Peacetime Roles

THOUSANDS UPON THOUSANDS of returning G.I.'s, with permanently calloused mid-posteriors to remind them of weary hours of wrestling Jeeps over the battlefields of the world, haven't seen the last of those ubiquitous little vehicles. The versatile, indispensable wartime Jeep now emerges as an equally versatile combination of passenger car, light truck, tractor and mobile power plant. Redesigned and manufactured by Willys-Overland Motors, Inc., of Toledo, Ohio, the new model closely resembles the military Jeep, but is engineered to power numerous stationary units, to pull heavy equipment over the highways at a rapid rate, and to perform as a small wheeled tractor.

A most important addition to the military vehicle is a special power take-off on the new Universal Jeep operating through a splined shaft to furnish power direct or through a belt pulley. A power supply up to 30 hp. is thus available to operate various kinds of equipment. New gear ratios in the transmission, transfer case and axles allow a speed of 60 mph. on the highway. For tough going the Jeep can plod along efficiently at 3 mph. in the

(Continued on page 152)

POSTHOLE DIGGER is operated by power-take-off mounted on rear of post-war jeep.

SNOW PLOW AND GRADER ATTACHMENTS convert Jeep into effective unit for street and highway work.

CAPSTAN WINCH mounted on front frame between bumper and radiator pulls stump in land clearing. It is designed for 5,000-lb. pull.

SERVING ON CONSTRUCTION FRONT is this army jeep used by timechecker on Anderson Ranch Dam in southwestern Idaho.
U. S. Bur. of Reclamation Photo

LEGAL ADVENTURES of TRACTOR CONN

By LESLIE JOBB

No contractor ever tries to be his own dentist or his own shoemaker. It is even more dangerous for him to be his own lawyer. There are, however, some legal rules which every contractor should know, and these rules may be explained in plain English without resorting to the jargon of the law, unintelligible to most laymen.

This series of articles, dealing with the Legal Adventures of Tractor Conn, a typical contractor anywhere in the United States, explains some of these legal points in plain language for the contractor. Each one is based on an actual decision of an American Court.

The Case of the Defective Work

Tractor Conn erected a building for White and did defective work, but White took over the building without protest. Black was injured on account of the defective job, while lawfully on the premises, and claimed damages from White.

"I was injured in your building," Black pointed out.

"True, it was my building, but you were injured because of Tractor Conn's defective work, so you'll have to take your troubles to him," White declared, and Black told his story to Conn.

"I admit for the sake of argument that the work was defective. If you had been injured while I was on the job you would have had a good case against me, but White has taken the building over, and with it the responsibility for any defects," Tractor Conn argued. The Oklahoma Supreme Court ruled in Conn's favor, in the case of Armstrong vs City of Tulsa, 226 Pacific Reporter 560. The Court points out that "the contractor remains liable, if at all, only for the breach of his contract."

"All the acceptance that is required by the owner of Tractor Conn's work, in order to relieve Conn from liability for injury to a third person after the acceptance, is a practical acceptance, after the completion of the work, a formal acceptance not being required," the Court goes on to say.

The Case of the Fourth Installment

"Now it's understood that we're to supply you with $2,000 worth of this roofing each month for 6 months and that you're to pay for each installment delivered on or before the 20th of each month," the wholesaler said.

"That's the arrangement," Tractor Conn agreed, and signed an order blank to that effect. He accepted and paid for three monthly installments, but "fell down" on the fourth payment, and the wholesaler refused to ship any further installments.

"When you failed to make your fourth payment you broke the agreement, and that relieves me from my agreement to continue supplying you," the wholesaler argued and the Nevada Court, in a case reported in 33 Nevada 208, ruled in his favor.

"The view that the failure of either party to perform an essential term of the contract gives to the other the right to rescind that contract is sustained by the clear weight of American authority," said the Court, although some Courts have arrived at the opposite conclusion.

The Arkansas Supreme Court has qualified the rule to the following extent:

"If the breach of conditions of part payment is the result of accident or oversight or is attended by other facts and circumstances which are inconsistent with an intention to abandon the contract and which incline one to presume that the buyer intended to fully perform the contract, then the failure to pay in an installment at the agreed times does not work a forfeiture of the whole contract, but by tender of the future installment payments he may claim the benefits of the sale. But if the acts of the buyer in failing to make a payment of an installment indicated his intention to abandon the contract, as where the refusal to pay is wilful, and not through a misunderstanding or accident, the entire contract is held to be forfeited and the seller cannot therefore be compelled to perform the contract."

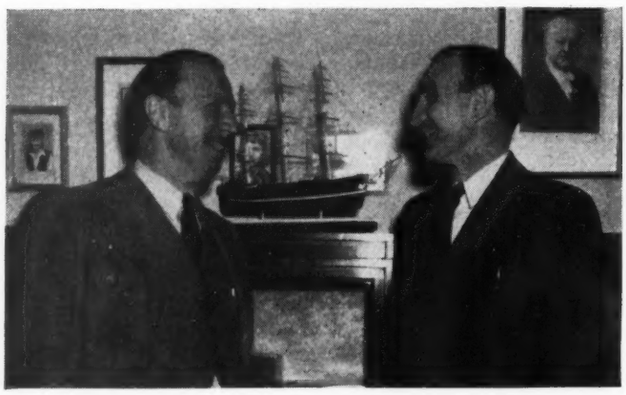
More Legal Adventures of Tractor Conn Next Month

Plenty of Distributors... But No Equipment

FRANK B. MCBATH, of Columbia Equipment Co., Portland, Ore., is new president of Associated Equipment Distributors.

SOME 1,500 DISTRIBUTORS AND MANUFACTURERS attending the 27th annual convention of the Associated Equipment Distributors at Chicago Jan. 28-31 were all looking in vain for the same thing—something to sell. The delegates listened to government and their own explanations and hopes about the present situation, and then elected new officers and directors for the current year. On the final day of the meeting the sudden death of H. O. Penn, retiring president, brought the proceedings to a sad closing.

The accompanying photographs show the officers and some of the guest speakers.



← LOWELL B. MASON (left), Federal Trade Commissioner, presided at Trade Practice Conference, and Senator WAYNE L. MORSE, of Oregon, urged removal of government controls.

→ STANLEY WARDELL, New York, gave an address on distributor advertising.

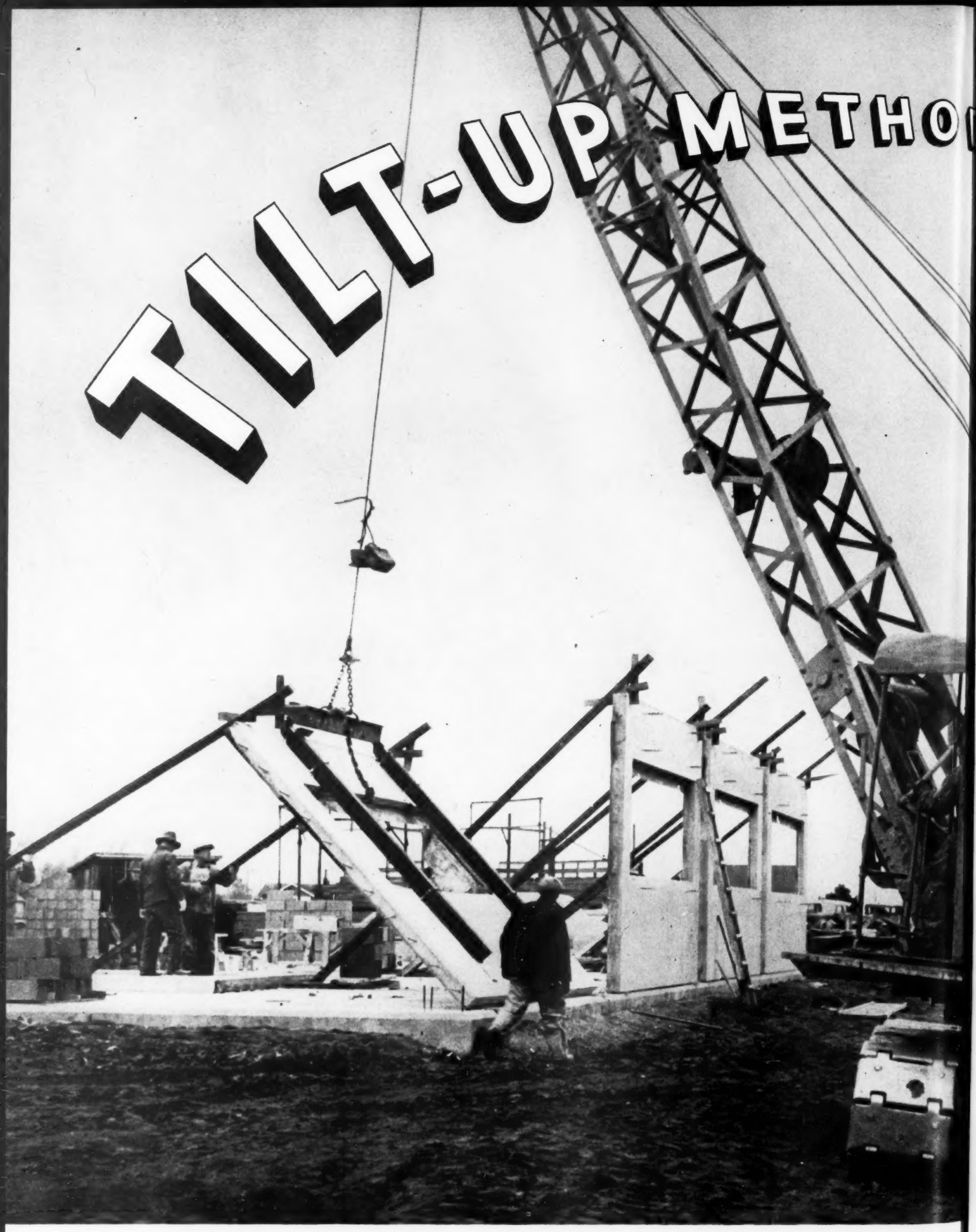
← AL GARLINGHOUSE, Los Angeles, talked about "Plans and Suggestions for Your New Plant."

→ HARRY DICK, Portland, Ore., president of Associated General Contractors, outlined construction prospects.

NEW A.E.D. OFFICERS (below) include, left to right: vice-president, C. F. HALLIDAY, Sioux Falls, S. D.; executive secretary, F. F. WINCHESTER, Washington, D.C.; treasurer W. W. BUCHER, New York City; vice-president W. J. KANE, Winnipeg, Man.; president F. B. MCBATH, Portland, Ore.; executive vice-president W. A. DANNER, Hyde Park, Mass. At extreme right is late H. O. PENN retiring president of association.

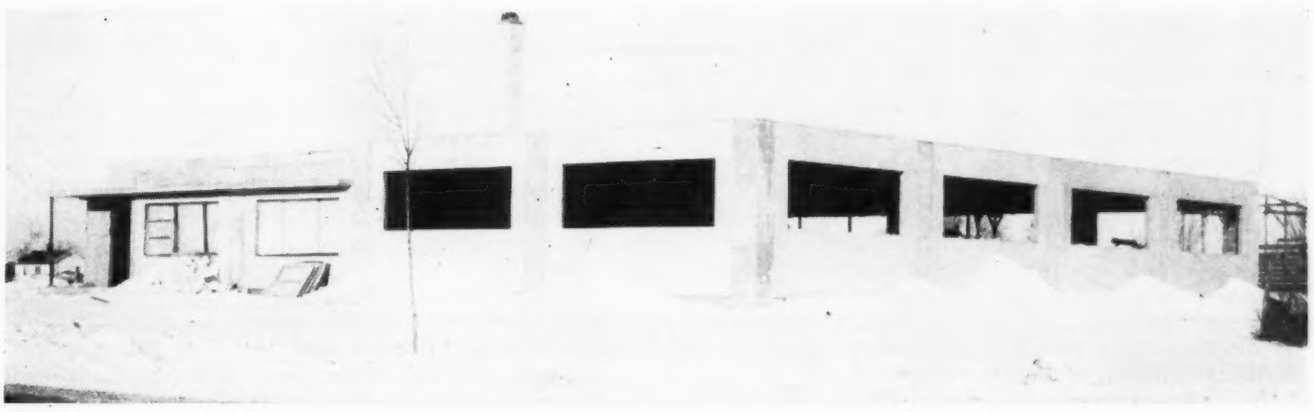
A Bailey Bridge Gives Up

BAILEY BRIDGES, an outstanding structural contribution to the war, served faithfully in countless installations throughout world-wide battle zones. But a "double-double" span of 140 ft. across the Marquina River just outside of Manila in the Philippines gave up under the load of a 6x6 truck and low-bed trailer carrying a Caterpillar D-8 tractor and towing a 15-yd. Le Tourneau scraper. The structure, as these views show, simply folded up in the middle and came to rest in the shallow stream bed. Replacing the original span blown up by the retreating Japs, the Bailey bridge enabled U.S. troops to attack Manila's back door. Following the collapse the Army engineers hurriedly threw a third span over the wreckage of the second, and military traffic was soon rolling unchecked over the river.



WALL PANELS for Holes Webway Co. building, St. Cloud, Minn., are precast and tilted up into position where they are securely braced until wall columns are cast. Lifting rig relieves panels of erection stresses. Louis Pinault, architect. Photo by Myron Hall, St. Cloud Times

FOR PLACING PRECAST WALL PANELS



LUMBER REQUIRED to form walls of this building was less than 1,000 ft. b.m. All form lumber was reused in interior partitions.

AS THE RESULT of more than one thousand applications, the tilt-up method of erecting precast concrete wall panels for one-story commercial, industrial and residential buildings, illustrated herewith, is believed to have possibilities for higher than one-story units. The method is claimed to offer wide architectural flexibility and ease of exterior surface treatment. Panel lengths and heights can be easily adapted to meet a wide variety of requirements. It is equally adaptable to standardized or individually designed buildings. Insulation and vapor seal can be readily attached to the inside of the wall (under side) before placing the concrete. Electrical and other conduits and outlet boxes are installed before concrete is placed.

The method makes extensive use of power equipment and lends itself to many economies and short cuts, particularly where several buildings are to be constructed in close proximity.

One-Story Industrial Building

Construction of the Holes Webway Co. building, St. Cloud, Minn., designed by Louis Pinault, architect, demonstrates that there is no need to delay erection of one-story industrial buildings because of shortages of certain classes of labor and kinds of materials. Precast concrete wall panels cast in a horizontal position on the concrete floor of the building and tilted up into position made possible the construction of the building with the minimum use of critical labor and material. Less than 1,000 ft. b.m. of lumber were needed to build 2,650 sq. ft. of wall and all of this lumber was finally used in interior partitions.

The building, which is approximately 80 ft. square, was laid out to give as much duplication of wall panels as possible, although duplication of panel is not essential to the method of construction nor does it result in much additional economy. The reason for this is that the only form required for a panel in addition to the bucks for window and

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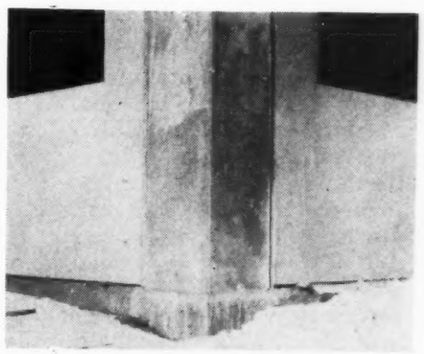
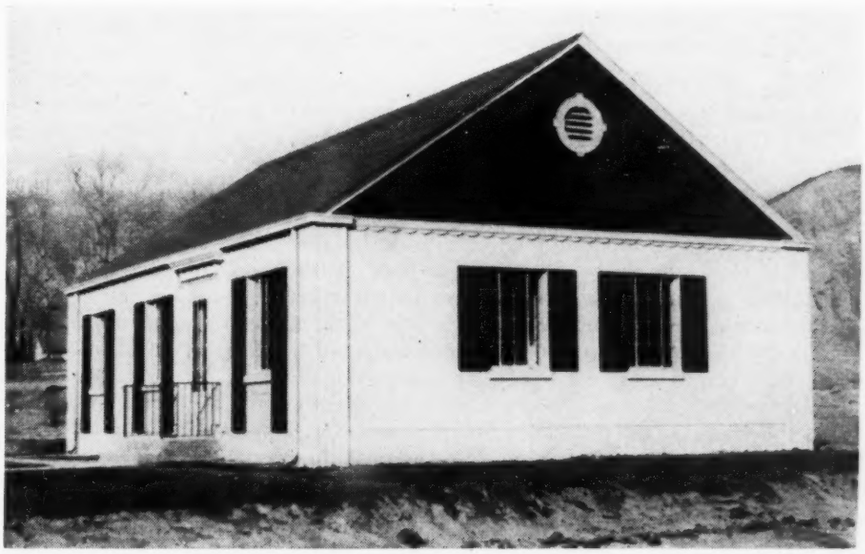


WEDGES SUPPORT wall panels until joint along bottom edge can be packed with dry portland cement mortar.



THIS FIVE-ROOM HOUSE was constructed by tilt-up method.

THE PRESIDENT'S WAGE-PRICE POLICY WON'T WORK

THE AMERICAN public had every right to expect that the long-awaited wage and price policy would break the impasse blocking the way to the swift and orderly reconversion of industry from war to peace.

The policy announced offers little promise of such solution, and this may well constitute a national calamity.

There is only one thoroughly constructive feature of the Presidential Statement of February 14 and its implementing Executive Order. It is the first Government pronouncement since the defeat of Japan to clearly define inflation as the major danger confronting us in the period immediately ahead.

That is a correct appraisal, and one long overdue. Up to now Government spokesmen, almost invariably, have sought to carry water on both shoulders. The Administration has justified its policy of promoting wage increases as a measure necessary to forestall deflation — to keep purchasing power from falling and forcing the economy into a violent tailspin. The strict holding-of-the-line on price ceilings has been defended as necessary to prevent runaway inflation. Unfortunately, while the President now exhorts all to enlist in a crusade against inflation with a voice that is clearly Jacob's, his program for dealing with it still employs the hairy hands of Esau to promote the very danger which he is urging everyone else to combat.

The "new" policy provides for a continuation of the wage increases that have been pressured through by Government mediators, "fact-finding" boards, and direct seizures until they have been made general throughout industry upon the dimension established in recent patterns. It offers industry the single concession of prompt hearings and decisions upon claims for price advances, but the yardsticks for judging such claims are exactly those which OPA has applied in the past. Since the past procedure has led us into our present difficulties, it is hard to see how it will serve now to lead us out of them.

Past Government Policy Fostered Dissension

At the war's end, it was obvious to everyone that what was needed was the swiftest possible reconversion of industry. It should have been equally apparent that we were faced with the difficult problem of controlling tremendous inflationary pressures which would be particularly insistent until peacetime production could be mobilized at high volume. This was made almost inevitable by the huge backlog of accumulated demand, for both capital and consumer goods, and by the unprecedented volume of liquid funds at the disposal of individuals of all classes. The only circumstance that could have modified the inflationary complexion of the postwar picture was the possibility of such wholesale and prolonged dislocation and unemployment in the process of readjustment that people would have been frightened into freezing onto their savings instead of spending them.

It soon was apparent that just the opposite was taking place. The early transition was extraordinarily swift, unemployment was lower than anyone had dared hope, and civilian spending outstripped all previous records. The circumstances called for strong anti-inflationary fiscal measures, along with a firm maintenance of price and wage controls alike.

Instead of adopting such a balanced program, the Government immediately discarded all wage controls, and in addition started an active campaign for promoting large wage increases. The President, upon a number of occasions stated flatly that American industry generally could and should grant substantial pay advances without any compensating price rises. His Office of War Mobilization and Reconversion estimated that average increases were practicable to the extent of 24 per cent. Given such Governmental encouragement, it was inevitable that labor leaders should do exactly what they did—file extravagant wage demands at the beginning of the reconversion process, when accurate appraisal of production schedules and costs were least susceptible of calculation, and when the shortage of civilian goods multiplied the inflationary effect of any increase in purchasing power.

At the same time, the OPA was fighting to hold the price line in a good cause, but with singularly inept procedure. It acted, seemingly, upon the premise that it was always better to give less price relief than was needed rather than enough, that relief provided under its formula was preferably to be granted later rather than on time, and that the interests of lower-bracket income receivers should be protected by a particularly tough resistance to raising prices of cheaper goods. The latter procedure seems to have boomeranged by virtually driving many of the lower-priced lines off the market.

The sum of these wage-price procedures resulted in work-stoppages of epidemic scope. Many business concerns faced with the prospect of immediately unprofitable operation, uncertain that new wage demands would not be made with Government support as soon as volume production was established, and without assurance as to when price controls would end, refused to assume inevitable losses even when confronted with combined union and Government pressure. The fight was on.

"New" Policy Differs Little From Old

With inflation now clearly recognized as the immediate danger, it might have been expected that the new wage policy would reverse the former practise of lending active encouragement to new wage advances. But that would have brought down upon the Administration the wrath of all organized workers who had not yet been granted increases already bargained through by other groups. This was avoided by directing the National Wage Stabilization Board in effect to approve any wage increases necessary to give general advances comparable to those already made. The only brake applied on the wage side lies in a directive to the Board not to approve, as a basis

for price relief, wage advances that go beyond the established pattern.

On the price side, the new directives to the OPA entail no important departure from its past procedures. Even the concession to review "hardship" cases promptly rather than after six months is only a pious hope, since it is unlikely that OPA is equipped to deal rapidly with the thousands of cases that will arise. A hardship case is defined as one in which, after absorbing an approved wage advance, an industry or establishment in a twelve months' period of normal-rate operation is judged by the Price Administrator likely to operate at a rate of profits to net worth less than it averaged in the base period of 1936-1939.

Let us see what this really means. In the first place, the rate of manufacturing profits in the base period was only moderate. But since the average net worth of manufacturing corporations has increased one-third over what it was in the base period, the application of the OPA formula, *assuming that its Administrator correctly appraises the twelve-month outlook,* seems to provide for absolute profits one-third higher than the 1936-1939 average.

The OPA formula, however, applies to profits *before taxes.* What really matters to stockholders is profits *after taxes.* Corporation taxes have been increased from an average of 17 per cent in the base period to 38 per cent now. This means that the price adjustments granted by OPA on average will yield profits *after taxes* no larger in dollar terms than in the 1936-1939 period, although 1946 manufacturing sales are expected to be more than twice as high. Under this procedure the *ratio* to net worth of profits *after taxes* will be one-fourth lower than the 1936-39 average. This clearly undermines the incentives upon which production at high level depends.

The workers get wage increases which promote inflation. The Government, bailed out from its previous mistakes, gets political credit for raising wages. And the entire bill is handed to American industry for payment.

But the Danger of Inflation is Real

Under these circumstances, there is a growing demand on the part of business groups that price controls be rescinded immediately. It is argued that, once the restrictive influence of price controls is relaxed, capacity production soon will supply sufficient goods to prevent undue price inflation.

It is understandable that business should wish to be rid of Government controls which have operated in such a thoroughly inconsistent and damaging fashion. Unfortunately, there is ground for believing that more harm might result from this cure than from the disease.

There is nothing in our situation that could bring on the kind of inflation that has been experienced by certain countries of Europe and Asia – in which the value of currency deteriorates until it takes a cartload to buy a pair of shoes. But our situation now is definitely more threatening than it was in 1919, after the first World War. At that time wholesale prices and the cost-of-living skyrocketed almost 25 per cent within twelve months. If we discard all controls now, as we did then, prices might easily go up from 25 to 50 per cent in a year's time.

An inflation of that dimension can do tremendous damage. While it lasts, all those dependent upon fixed incomes are damaged – all bondholders, including those who hold war bonds, all life insurance and annuity beneficiaries, all pensioners. Generally, the purchasing power of wages and salaries would shrink, with white collar and unorganized production workers hardest hit. Controlled-rate industries, such as railways and other utilities, would be squeezed. General business would suffer least of all – while the boom lasted.

But such soaring booms cannot last. The 1919 boom burst in mid-1920. By summer of 1921 industrial prices had fallen 40 per cent and industrial production was off 35 per cent; farm prices had fallen 50 per cent. This time the boom might soar higher and last longer, but that would merely result in an even more precipitous drop. Business would be hard hit along with everyone else, and high wage rates would mean nothing to the unemployed.

Controls Must be Consistent and Progressively Relaxed

But if the Nation cannot afford to risk disastrous inflation by immediately abolishing controls, neither can business afford to accept the program which the Administration now proposes.

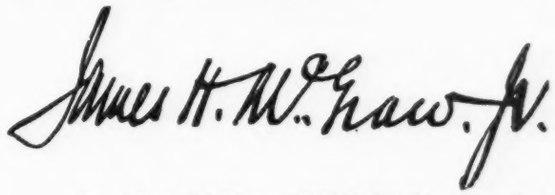
The wage-price policy will not hold the inflation line so long as the Administration is leading the assault to breach that line on the wage side, as it has done ever since VJ-Day.

The Administration is now going before Congress to ask for a broad extension of its wartime powers for an additional year beyond June, 1946.

Congress must see that this is not granted except upon terms that guarantee the use of such power with a consistency that has been conspicuously absent up to now.

1. It must provide sufficient price relief to yield profits normal to high-level operation.
2. The basis for price relief must be clearly defined and geared to actual costs of operation at the earliest possible date.
3. OPA administrative procedures must be speeded-up and streamlined, or the delays that characterized past administration will become intolerable.
4. It must see that, once established, the new line is held as long as wartime controls are continued by enforcing restrictions on wages as well as prices.
5. It must set an early date for the termination of all wartime controls and provide for progressive and bold steps for de-control to be taken before that date, as soon as production levels in any field are sufficiently high to restrain runaway prices.
6. It must proceed without delay to marshal fiscal and monetary policies to combat inflation, in order that price controls may be discarded at the earliest possible date.

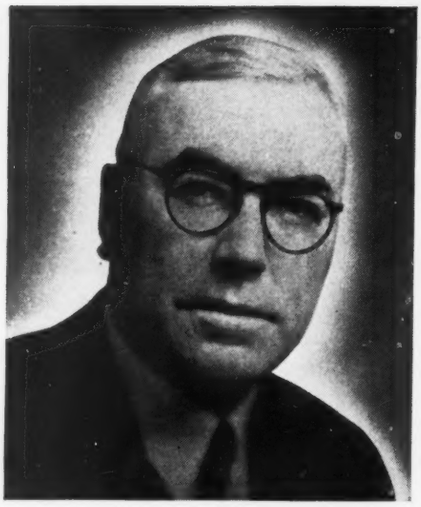
Unless Congress does this – and it will not be easy in an election year – we are headed for an explosion. It will come in one of two forms – either in a continuance of industrial strife, or in a rocketing inflationary boom that can only end in collapse and depression.



President, McGraw-Hill Publishing Co., Inc.

THIS IS THE 45TH OF A SERIES

Present and Accounted For...A PAGE OF PERSONALITIES



HONORARY MEMBERSHIP in American Society of Civil Engineers is conferred on CHARLES H. PURCELL, director, California Department of Public Works, and chief engineer of California-Oakland Bay bridge.

NEW PRESIDENT of the American Association of State Highway Officials is M. J. HOFFMANN, Minnesota commissioner of highways. He served last year as AASHO first vice-president.

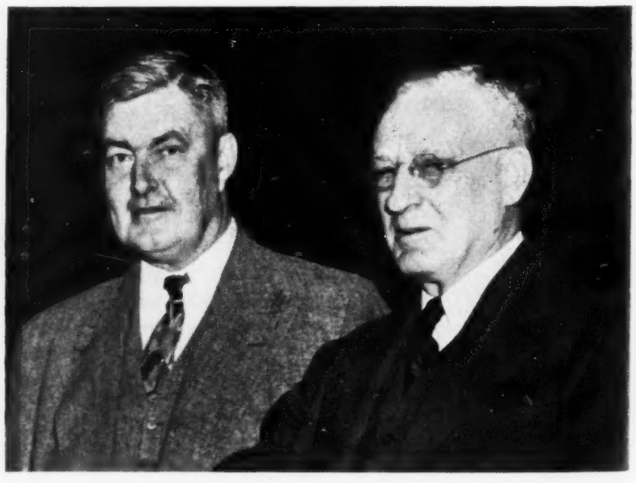
NAMED STATE HIGHWAY ENGINEER of New Jersey is COMDR. CHARLES M. NOBLE, former deputy director of advance base department, Navy Bureau of Yards and Docks. He was awarded Legion of Merit.

CONSTRUCTION ENGINEERING PRIZE of American Society of Civil Engineers goes to C. GLENN CAPPEL, of W. Horace Williams Co., New Orleans, La., for his paper on "Timber Hangar Erected from 16-Story Scaffold.

NEW DEPUTY MAYOR of New York City GEORGE E. SPARGO will continue to serve as general manager of New York City Tunnel Authority and Triborough Bridge Authority.

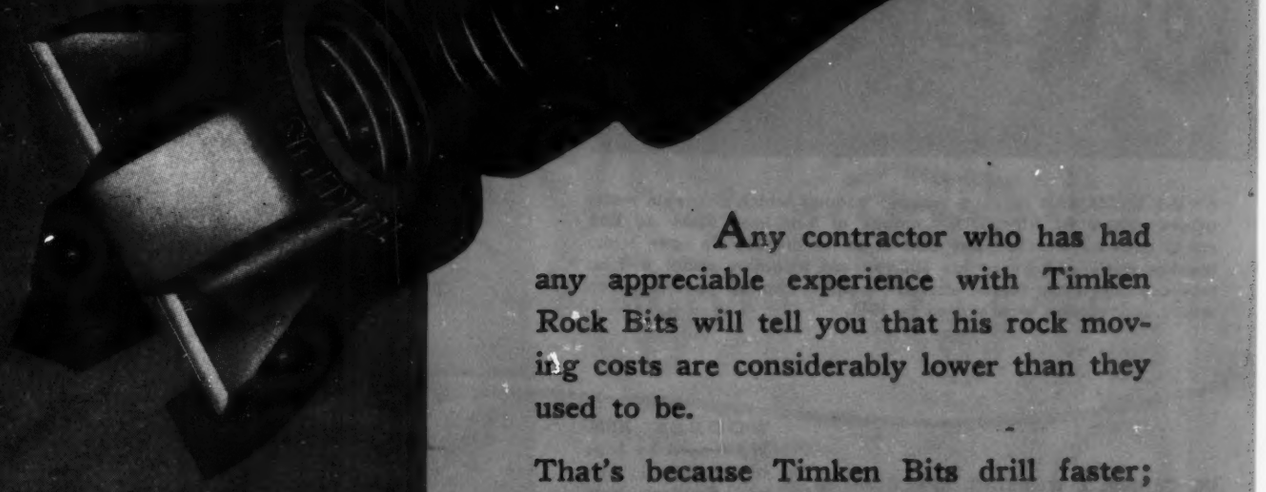
TRACK CLEARING OPERATIONS after slide in northwestern California are directed by (below, left to right): J. F. LOCKHART, division engineer, Northwestern Pacific R. R.; ROY CHAPMAN, supervisor of maintenance and equipment, Southern Pacific R. R.; and F. L. MONROE, drainage engineer, Southern Pacific R. R.

ASSOCIATED GENERAL CONTRACTORS OF AMERICA installs new officers (below) at 27th annual convention in Chicago, Feb. 18-21. They are W. S. BELLOWS (left), of Houston, Tex., president, and F. W. PARROTT, of Sioux City, Iowa, vice-president. Mr. Bellows was formerly vice-president.



Contractors say

ROCK DRILLING COSTS ARE LESS WITH Timken Bits



Any contractor who has had any appreciable experience with Timken Rock Bits will tell you that his rock moving costs are considerably lower than they used to be.

That's because Timken Bits drill faster; yield more footage per bit; can usually be reconditioned several times for additional service life; drastically cut steel costs; save the drillers' time.

These advantages spring from a combination of design, material and manufacturing technique that cannot be duplicated. No other bit manufacturer makes his own steel. No other bit manufacturer has the benefit of such far-reaching metallurgical knowledge and experience.

If you've never used Timken Bits you don't know what you're losing. Write for name of nearest authorized distributor. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

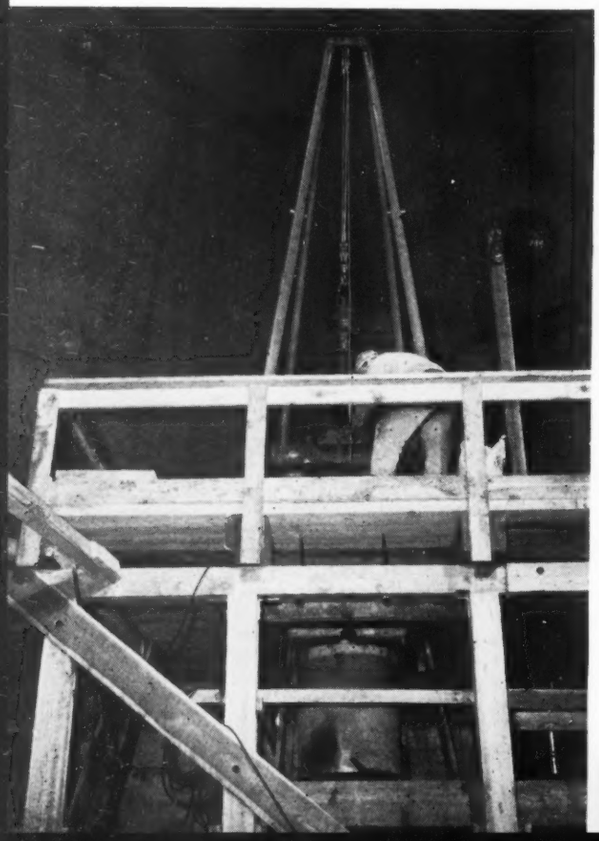
ROCK BITS

JOB oddities

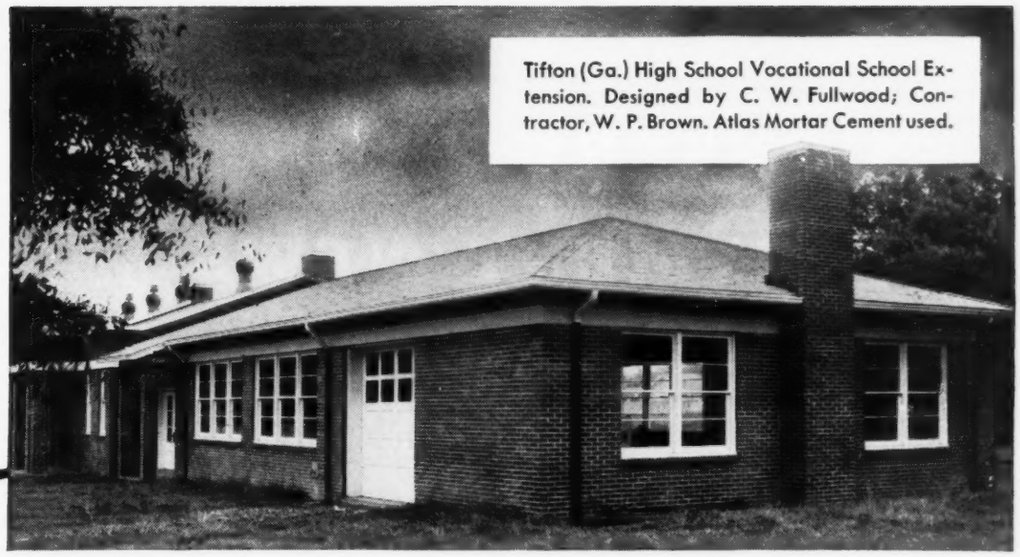
SWISS WORKMAN inspects wooden conduit which channels water across chasm in Alps. All conduits of 6-mi.-long Bisse de Roh canal must be watched day and night for breaks. To save maintenance costs and lives, this 500-year-old irrigation canal will be replaced by 2-mi. tunnel driven straight through mountain, on which construction was started in 1942. Wide World Photo

→ WOODEN RUNWAY used by Japs at Municipal Airport, Sapporo, Hokkaido, Japan, is examined by CAPT. ROBERT A. HICKERSON, of U. S. Air corps, after landing flying fortress. Runway, constructed of thousands of 4-in. planks is more than 4,000 ft. long and almost 300 ft. wide.

IN CRAMPED WORKING SPACE of bay (below) in right powerhouse at Grand Coulee Dam 36-in. calyx drill is drilling two vent holes over discharge outlet of 84-in. needle valve. U. S. Bur. Reclamation Photo



MINE DETECTOR (below) is used by Army Engineers to locate pieces of shrapnel and steel imbedded in logs cut from pine trees near firing range at Fort Bragg, N. C. Thousands of bullets and shell fragments, like those at right, were detected and chopped out so logs could be sawed into lumber. Signal Corps Photo



Tifton (Ga.) High School Vocational School Extension. Designed by C. W. Fullwood; Contractor, W. P. Brown. Atlas Mortar Cement used.

QUICK FACTS ABOUT

ATLAS MORTAR CEMENT

The Satin of Masonry Cements

Experience of users shows that Atlas Mortar Cement has the following characteristics:

Makes Buttery Mortar—smooth and highly plastic—a treat for the trowel.

Provides Satisfactory Yield—the measure of the amount of mortar produced by a bag of cement and the number of brick, block, tile and other units that can be laid up with the resultant mortar.

Backed by years of research, field studies, investigation of raw materials, laboratory tests, and control of manufacturing methods.

Complies with Federal and ASTM specifications for masonry cement. Rates high not only in some single essential but in all desirable characteristics—in plasticity, yield, durability, color and strength.

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ATLAS MORTAR CEMENT

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Send for detailed information. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

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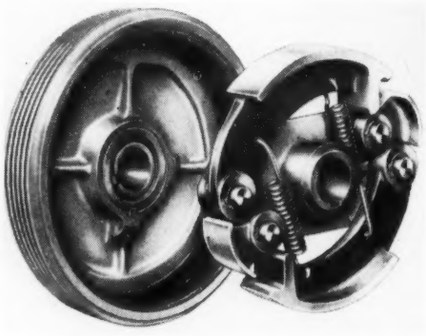
CONSTRUCTION EQUIPMENT NEWS

MARCH 1946 REVIEW
of Construction Machinery and Materials

OPEN-BOWL SCRAPERS in three sizes are matched in capacity to power of Caterpillar diesel tractors and built to perform with them as complete earthmoving package. Designated as Nos. 80, 70 and 60, scrapers have respective struck measures of 13.8, 8.7 and 6.0 yd. Features include: Open-bowl design for greater stability, visibility and access for shovel or dragline loading; high apron lift to clear sticky materials; positive, clean ejection; long cable life from correct reeving, over-sized precision-grooved sheaves; double-curved, self-sharpening cutting edges for "live loading" with longer boiling action, digging hard material, shorter loading distance and less loading time; and optional tire sizes for correct flotation.—**Caterpillar Tractor Co., Peoria 8, Ill.**

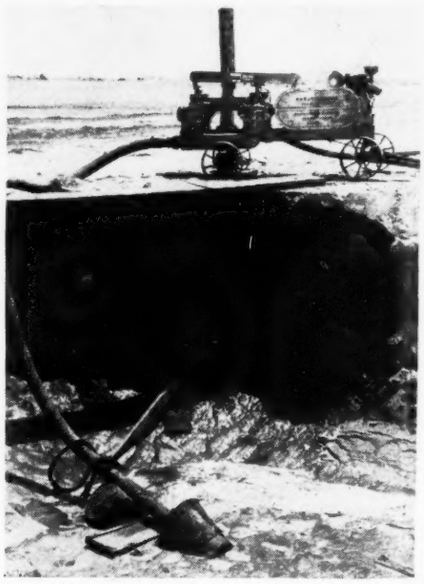
AUTOMATIC CLUTCH for eliminating shock of starting machinery or moving equipment can be installed direct on shaft of any engine or electric motor and is suggested for use on small scrapers, bulldozers, graders, cement mixers, small hoists and winches. Device by centrifugal motion progressively applies power to driven machine, engaging and disengaging without operator control. Offers advantage of fluid drive, but in addition permits complete disengagement while idling and positive engagement when driving with no possibility of slippage. Centrifugal principle in simple form is employed to obtain velvet-like action. Clutch is opposed shoe type, dual spring balanced, to give desired degree of tension required for individual applications. Below a predetermined rpm. of engine or motor, clutch idles; when driving rpm. increases beyond stipulated rpm., expansion shoes press outwardly contacting friction lining of drum. Two models available, one for range from fractional to 3 hp., and one for up to 6 hp. Different drives may be mounted on shaft—



V-belt or flat belt pulley, gear, sprocket, coupling or variable speed transmission. 3-hp. model has drum diameter of 5¼ in. and length of 2 11/16; 6-hp. model has drum diameter of 7¼ in. and length of 4½ in.—**Salsbury Motors Inc., 4464 District Blvd., Los Angeles 11, Calif.**

INTERNAL COMBUSTION LUBRICANT claimed to have unusual advantages over mineral oil, particularly for cold weather use, can be manufactured to any desired viscosity and is wax free. Pour-points vary from —30 to —80 deg. F. Flash points range from 300 deg. F. upward. New materials have densities approximating that of water. Carbon residue values are less than 0.01 percent regardless of viscosity. Lubricant is characterized by low change of viscosity with change of temperature having viscosity indices in the range of 140 to 160. Contains no petroleum oils. Claimed practically to eliminate sludge and varnish formation in engine. Wear of moving parts is in line with wear experienced with ordinary mineral oils. Manufactured in two types, water soluble and water insoluble. Latter type is used for lubricating internal combustion engines and all kinds of machinery operated under conditions of low temperature or where a non-sludging oil is required.—**Carbide and Chemicals Corp., 30 East 42nd St., New York 17, N. Y.**

POWER DRIVEN DIAPHRAGM PUMPS for general post-war construction use and known as "Marlow Mud Hogs," are available in 3- and 4-in. single and 4-in. double sizes, with capacities ranging from 3,000



to 9,000 gal. per hr. Features: (1) Non-clogging ball valves; (2) quickly-accessible valve chambers; (3) renewable valve seats; (4) powerful steel walking beams which are claimed to be virtually indestructible; (5) double bushings; (6) long-life diaphragms; (7) clamping rings which permit diaphragms to be replaced in 6 to 8 min., (8) oversize pump bodies; (9) extra heavy gearing, and (10) heavy-duty construction throughout. Used for pumping water, mud, sand, ooze, slush, gumbo, slime, grit and liquids which contain large amounts of trash. Claimed to keep excavations dewatered right down to bottom.—**Marlow Pumps, Ridgewood, N. J.**

GAITED

To Every Job Requirement

8 OVERLAPPING FORWARD SPEEDS give Adams Motor Graders exactly the right "gait" for every type of grading operation . . . for ditch and bank cutting—for blading and scarifying—for aggregate mixing and spreading . . . plus transport speeds up to 21 m.p.h. for fast moving from job to job.

Translated into end results, Adams' flexible range of speeds means *fastest practical operation on every job—more work per day—more profitable operation . . .*

What's more, in Adams Motor Graders you get a host of other features essential to efficient, long-life performance . . . rugged strength—rigidity—balanced weight distribution—fast, accurate blade controls—wide range of usefulness—minimum operating and maintenance costs.

Phone or visit your local Adams dealer. He will gladly show you why it's always good business to specify Adams Motor Graders.

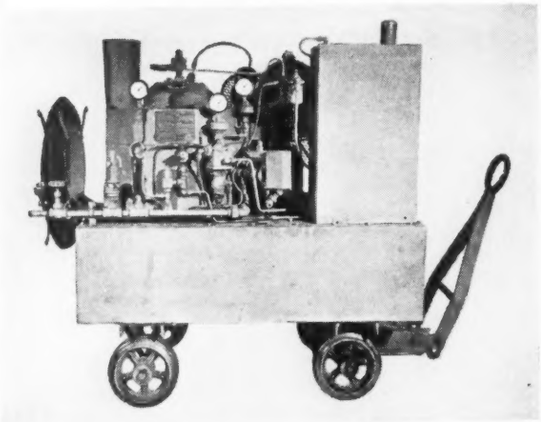
J. D. ADAMS MANUFACTURING CO., ***Indianapolis, Indiana***

ADAMS

ROAD BUILDING AND EARTH-MOVING EQUIPMENT

IT'S NEW

OAKITE-VAPOR STEAM CLEANING UNIT



Scientifically Engineered to Revolutionize Steam-Detergent Cleaning

•

For Cleaning:

BACK DIGGERS
BITUMINOUS FINISHERS
PAVING BREAKERS
CONCRETE BUGGIES
CONCRETE-FINISHING MACHINES & VIBRATORS
CRANES
WAGON CRAWLERS
GYRATORY CRUSHERS
DISC HARROWS
DRAWN GRADERS
EARTH-DRILLING MACHINES
ELEVATING GRADERS
DRAGLINE EXCAVATORS
FOUR-WHEEL SCRAPERS
FRONT END LOADERS
TRENCH HOES
MIXERS
HIGHWAY POWERED MOWERS
OVERHEAD SHOVELS
GRADING PLOWS
PORTABLE ROLLERS
POWER SHOVELS
REVOLVING SCREENS
RIPPERS
ROLL CRUSHERS
ROOTERS
ROTARY SCRAPERS
TAMPING ROLLERS
SHOVEL TRACTORS
TRUCKS
TRANSPORT TRAILERS

Here is the new quality-engineered steam-cleaning unit so many construction men have been waiting for! It is a self-contained, enclosed-coil type steam generator. Oil fired by down-draft flame, this stationary or mobile unit provides ample steam for rapid steam-detergent cleaning of equipment in the shop or out in the field. Check these amazing features:—

SIMPLICITY OF OPERATION: After starting, *only one valve* need be adjusted during entire cleaning procedure! Designed for two-gun cleaning, it may be operated at full capacity with both steam guns in action continuously and simultaneously.

RAPID STEAM GENERATION: Starting from cold, unit generates 100 pounds pressure in one minute; 200 pounds pressure in two minutes.

RESERVE POWER: Unit operates without vibration at pressures greatly in excess of requirements. This vibrationless power eliminates strain . . . prolongs equipment life.

HIGH-DELIVERY CAPACITY: Delivers 60 gallons of vaporized cleaning solution under pressures adjustable up to 200 p.s.i. in one hour.

LARGE CAPACITY: 80-gallon solution tank gives longer operation without recharging.

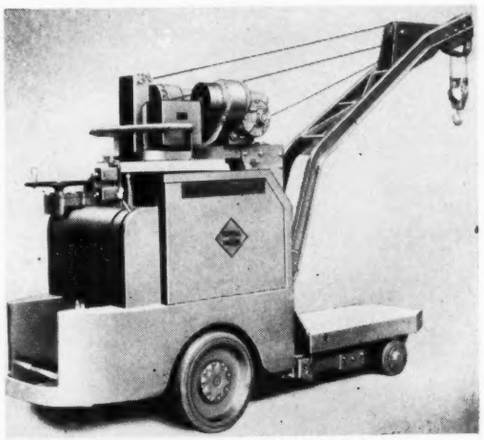
Send for Technical Data

WRITE TODAY for illustrated six-page folder containing operating data, specifications, and detailed description of unit . . . describes jobs in which you can save money by fast removal of grime, grease, cement dust, paint, etc.

OAKITE PRODUCTS, INC., 24G Thames St., NEW YORK 6, N. Y.
Technical Service Representatives Conveniently Located in All Principal Cities of the United States and Canada

OAKITE *Specialized* **CLEANING**
MATERIALS · METHODS · SERVICE · FOR EVERY CLEANING REQUIREMENT

COMBINATION CRANE-TRUCK, improved model, now has a separate motor for raising and lowering boom, thus providing operator with greater freedom of choice in manipulating load. Unit is 4-way truck serving as lift-truck, load carrier, crane and tractor. It loads either by picking up skid loads with lift platform or by lifting heavy parts and

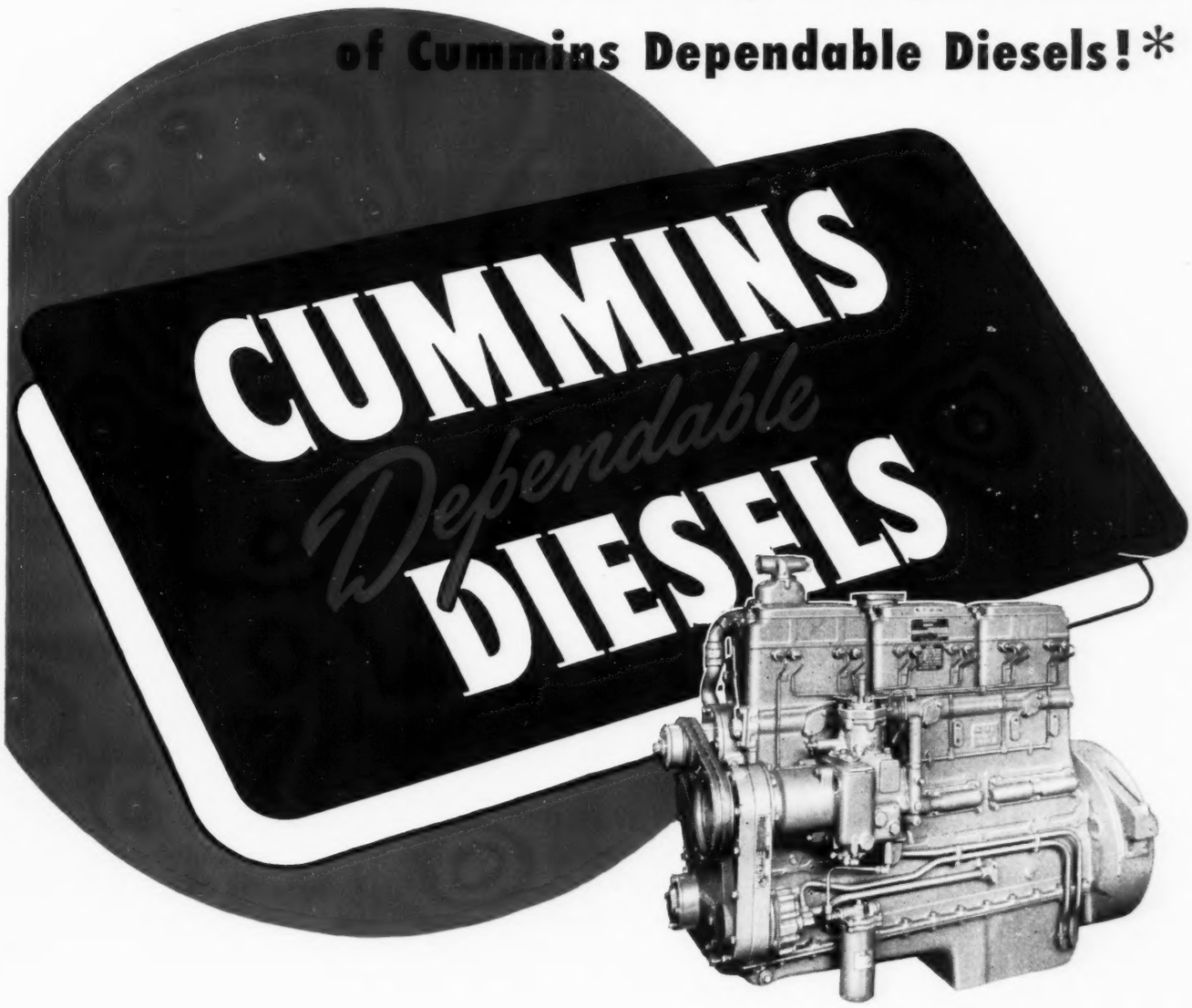


placing them on platform for transport. As a tractor it pulls trailer cars which may be loaded by crane. Crane may be made available for heavy lifting at points where there are no overhead cranes. Capacity, 6,000 lb. on platform, 2,000 lb. on hook at 42-in. radius, and 1,000 lb. on hook at 54-in. radius. Travels at 6 mph. with no load and 5 mph. with full load under normal conditions. Platform is deeply flanged to insure rigidity and has three-point positive support that assures load stability at all times.—**The Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 14, Ohio.**

FAST-ACTING PORTABLE FIRE EXTINGUISHER, named Alfite Speedex, is engineered to extinguish speedily small oil and electrical fires with no loss of the important extinguishing gas on anything but the fire itself. Operating valve is placed directly above the carrying handle and can be instantly

opened by the pressure of the hand grip and as quickly closed by releasing the hand pressure while operator is maneuvering his position. For continuous operation the D-yoke ring is slipped over the operating lever while it is depressed. Made in three sizes, Models 15, 10, and 4, and uses carbon dioxide as the fire extinguishing agent. Numbers of models indicate pound-capacity of gas. — **American-LaFrance-Foamite Corp., Elmira, N. Y.**

Proved dependable...through millions of work-hours...handling and moving millions of tons. On these tough jobs you can't beat the proved performance of Cummins Dependable Diesels!*

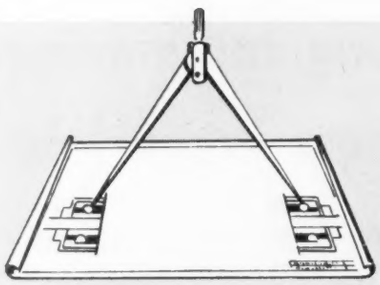


*_The Facts:_ No fewer than 54 of the nation's first-ranking builders of material handling and earth moving equipment today offer Cummins as standard or optional original power! What better proof of proved performance? For every heavy-duty job in the construction and aggregates industry, there is a proved-on-that-job Cummins Diesel—150-200-275 hp (maximum).

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

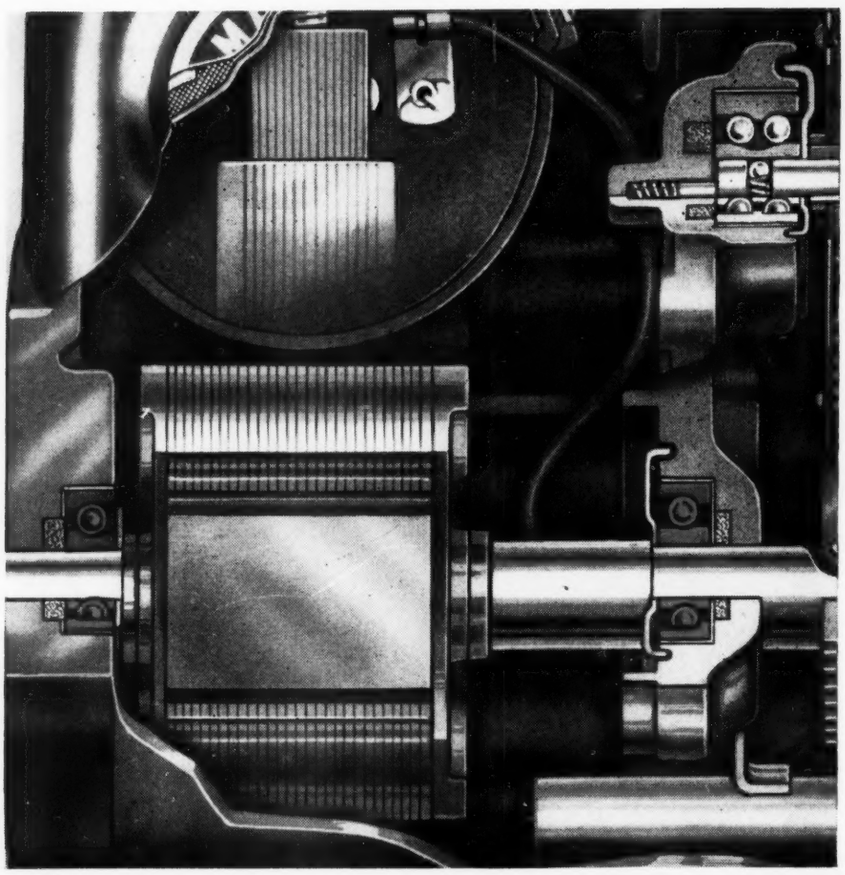
GOOD MAGNETOS

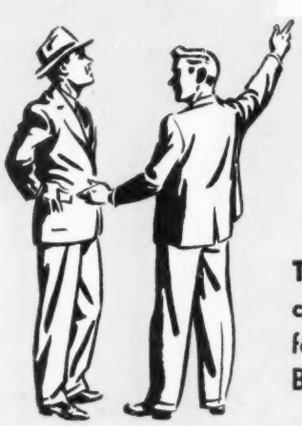
have Correctly-spaced Bearings

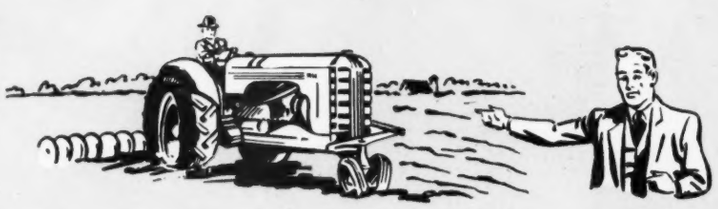


CORRECT SPACING IS VITAL. It is vital that spacing between rotor and rotor tunnel be maintained to hair-line accuracy. This can be done only by correctly-spaced bearings, maintaining proper alignment of the rotor under all operating conditions.

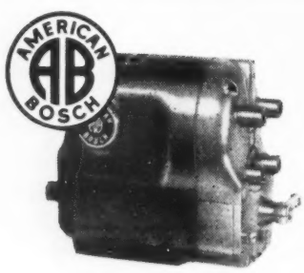
AMERICAN BOSCH MAGNETOS have correctly-spaced bearings for longer life and smoother, more-dependable performance.







THEY CAN TAKE IT. They stand up under the most gruelling conditions because they are balanced for smooth, vibration-free performance. You'll find many such hidden values behind the American Bosch trademark on all types of automotive electrical equipment.



AMERICAN BOSCH CORPORATION, SPRINGFIELD 7, MASS.

AMERICAN BOSCH

Super-Powered Magnetos

PMCO

America's Most Complete Line of Material Handling Buckets

All purpose-

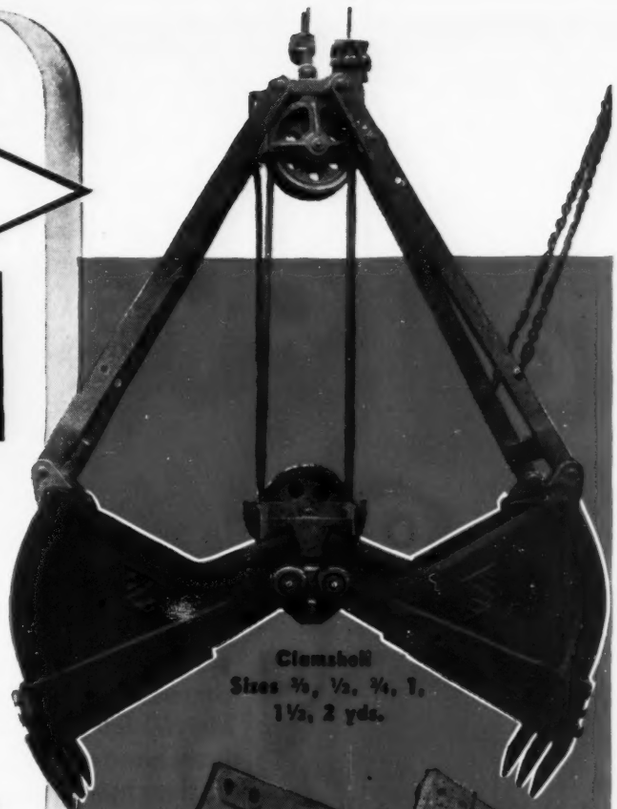
- SHOVEL
- PULLSHOVEL
- DRAGLINE
- CLAMSHELL

● FRONTS, BOTTOMS, SCOOPS and TEETH shown in red on buckets are 14% manganese steel developing tensile strength up to 120,000 p.s.i. This high percentage manganese steel gives tough, rugged strength for hard service and allows wide set corner teeth for easy entrance in digging. Volume production methods enable us to build a better bucket with amazing economies in manufacturing.

On the ½ yd. and ¾ yd. Shovel, Pullshovel, and Dragline Buckets, all teeth are interchangeable — a great advantage to operators.

Experience Counts

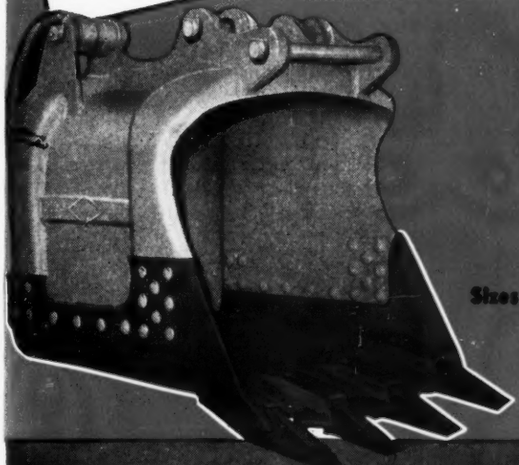
See your shovel man or equipment dealer about PMCO Buckets and Dippers.



Clamshell
Sizes ⅜, ½, ¾, 1, 1½, 2 yds.

Pullshovel
Sizes ⅜, ½ and ¾ yd.

Dragline
Sizes ⅜, ½, ¾, 1, 1½, 2, 2½ yds.



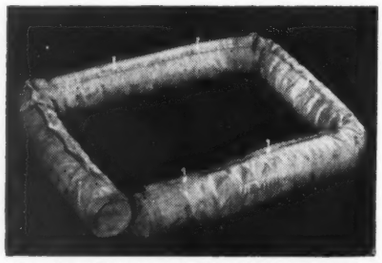
Shovel
Sizes ⅜ to 18 yds.

"Quality Since 1880"

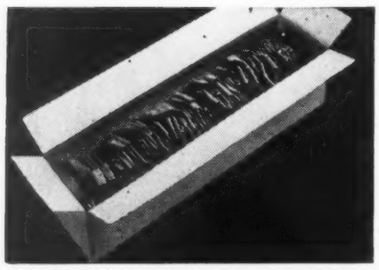
PETTIBONE MULLIKEN CORP. CHICAGO 51, U. S. A.

WE OPERATE THE LARGEST AND MOST COMPLETE MANGANESE STEEL FOUNDRY IN THE UNITED STATES.

NEW!
DU PONT
NON-COLLAPSIBLE
HELICAL-TYPE
"VENTUBE"*
HELICAL-TYPE "Ventube" has a tempered steel inner spring that keeps tubing flexible and expanded, maintains maximum air flow.



HELICAL-TYPE "Ventube" bends easily, can be turned sharply in any direction without appreciable reduction of air flow.



HELICAL-TYPE "Ventube" accordion-folds at a ratio of 15 feet to 20 inches. This means easy handling, compact storage.

▶ Here's a *new* work-speeder for all contractors! Du Pont non-collapsible *Helical-Type* "Ventube" carries fresh air to or exhausts foul air from workers in sewers, tunnels, and other confined areas. And tests by shipbuilders show that *Helical-Type* "Ventube" does this job *better by 60%* (at 2½" water suction) than regular non-collapsible "Ventube"!

Helical-Type "Ventube" assures a steady flow of air no matter the degree at which the tubing is bent. Doubled back at 180°, it will exhaust *8 times more air* than regular non-collapsible "Ventube." Yet, size for size, it *weighs but half as much!*

Learn the many ways in which Du Pont's *new Helical-Type* "Ventube" can serve you! Just clip the coupon below. It will bring you many helpful facts on this time- and cost-saving Du Pont development. E. I. du Pont de Nemours & Co. (Inc.), "Fabrikoid" Division, Fairfield, Conn.

*"VENTUBE" is Du Pont's trade mark for its flexible, synthetic-rubberized ventilating duct.

DU PONT "VENTUBE"
Reducing Costs Through Better Ventilation

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

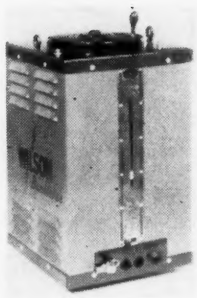
E. I. du Pont de Nemours & Co. (Inc.)
"Fabrikoid" Division, Fairfield, Conn.

Please send me details on *Helical-Type* "Ventube."

*Name*_____

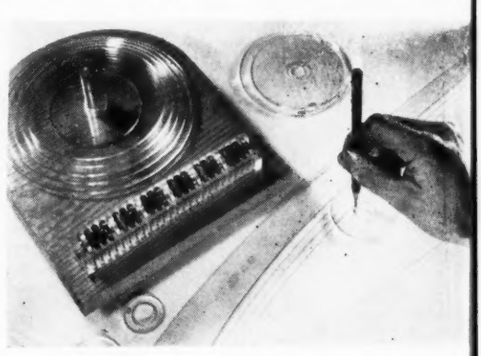
*Firm*_____

*Address*_____



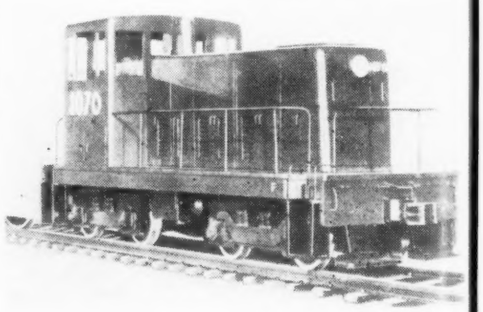
200-AMP. TRANSFORMER WELDER to meet need for high quality ac. machine of medium capacity has built-in capacitators which make possible power economies up to 35 percent, reduce power bills and power input and relieve overloaded transmission and plant feeder lines, making room for additional equipment. Unit also is equipped with a disconnect switch. Self-contained, "Bumblebee" has two ranges of current: low from 30 to 110 amp and high from 90 to 275 amp. Continuous stepless current control is provided throughout each current range by turning crank on top of machine. Full view scale makes current settings easy to read. Constructed for dependable, economical service. All windings covered with spun-glass fiber, heat-resistant, non-inflammable insulation.—**Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.**

DRAWING SPLINED LINES is expedited by Plexiglas and aluminum rings in graduated size. Disks for producing parallels at intervals from 0.010 in. to 0.0260 in. are made of aluminum in 25 increments of 0.010 in. Larger disks for intervals from 0.25 to 3 in. are made of transparent Rohm & Haas



Plexiglas. Procedure consists of laying disk tangent to flexible spline or rigid French curve that has provided base curve, inserting pencil in disk's center hole, and drawing line parallel to original curve. Successive parallels are handled from original base with larger and larger disks.—**Jackson Instrument Co., Ferguson, Mo.**

600-HP. DIESEL ELECTRIC LOCOMOTIVE, suitable for both heavy yard duty and road service, weighs 70 tons and has a top speed of 55 mph. Expected to find wide use in yard switching, scheduled road hauls, and transfer work. Adequately powered for passenger station switching and light-traffic



passenger service. Said to be particularly adapted to freight and passenger service on railroad lines where roadbed and rail weight require limited axle loadings. Locomotive is powered by 6-cylinder diesel engine rated 660 hp. at 1,000 rpm.—**The General Electric Co., Schenectady, N. Y.**

"Armstrongs are long on performance"

R. L. VILLENEUVE, Pres.
Victory Coach Lines
Chicago, Ill.

● "Operating our coaches to keep abreast of war-time travel needs has meant making every tire mile count. Each tire we purchase must pay its way—and we demand long wear, safe, trouble-free service, and low operating cost. I have found that when it comes to such a test and the chips are down—Armstrongs are long on performance!"

SINCE 1912 hundreds of commercial car operators have discovered that *you can't buy a better tire than an Armstrong!* Our pioneering efforts in making tires that wear longer and cost less have brought great savings to the buyer.

From the modern Armstrong Research Laboratories will come post-war products with new features to serve you better at lower cost. You may be sure—if it's an Armstrong Tire, it's *one of the best!*

For literature or information write your Armstrong distributor or to Armstrong Rubber Company.

ARMSTRONG TIRES

Manufacturers of Quality Tires and Tubes Since 1912 · General Offices and Plant—460 Elm Street, West Haven 16, Conn.

One-Man Operation
Accurate Batching
Uniform Flow with Heltzel Tubular Valve
Easily Accessible

Accurate batching any given proportion day after day, year in and year out, often means the difference between profit and loss to you.

Heltzel, in business for 34 years, manufactures equipment for any style of bulk cement operation, as exemplified by these major Heltzel products:

Portable Bulk Cement Plants
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Address_____

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_____
(Type of Construction usually engaged in)

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- CEMENT BINS, Portable and Stationary
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- BATCHERS (for batch trucks or truck mixers with automatic dial or beam scale)
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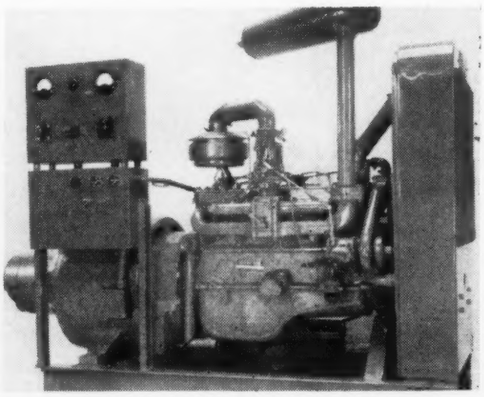
- CURB FORMS
- CURB AND GUTTER FORMS
- SIDEWALK FORMS
- SEWER AND TUNNEL FORMS
- CONCRETE BUCKETS
- SUBGRADE TESTERS
- SUBGRADE PLANERS
- TOOL BOXES
- FINISHING TOOLS FOR CONCRETE ROADS

HELTZEL STEEL FORM & IRON CO. WARREN, OHIO · U.S.A.

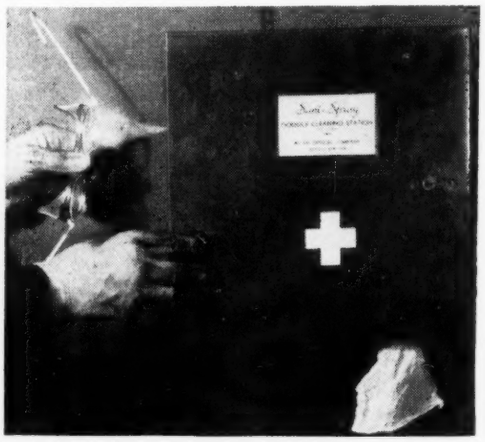
15,000-WATT GENERATOR for continuous duty or standby service in case of powerline failure and for use in construction operations is 120 to 208-v. ac., 60-cycle 3-phase and four wire 1,200 rpm., revolving field-type unit powered by Chrysler 6-cylinder 4-cycle water-cooled engine. Length 70



in., height 49¼ in., width 24⅜ in. Approximate weight 1,860 lb. This plant provides same kind of current as highlines, permitting operation of standard ac. appliances, lights, radios, and portable electric tools. Available for dc. operation or special voltages, if desired.—**Kato Engineering Co., Mankato, Minn.**

DIPPING PRESERVATIVE for plywood, structural woodwork and various articles made of wood provides longer life, water repellency and dimensional stability. Typical application of Lignophol dipping method is on steel-framed plywood forms for concrete construction. On prefabricated structural wood units it insures retention of original shape and form and substantially eliminates jamming of doors and windows due to swelling of wood caused by moisture.—**Building Products Division, L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y.**

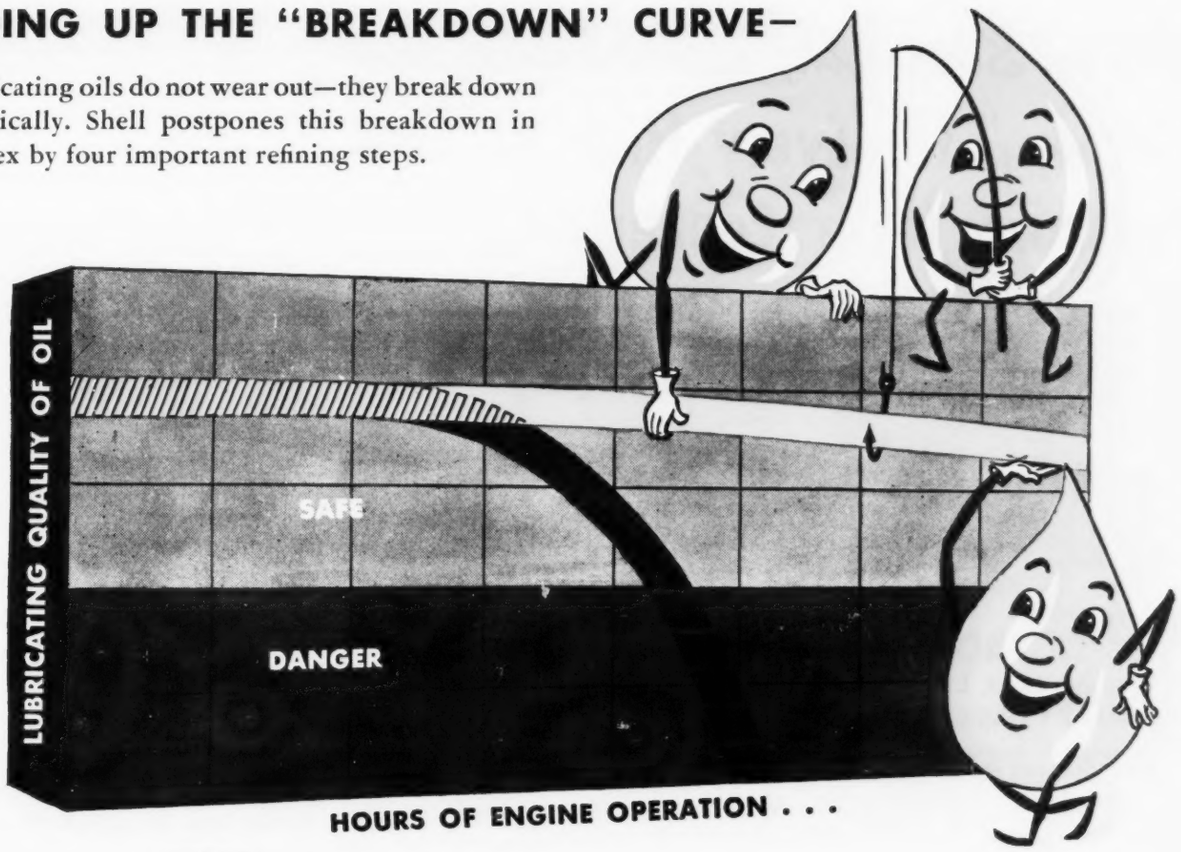
GOGGLE STATION AND CLEANER for industrial use consists of a self-contained heavy duty steel atomizer cabinet which holds a quart jar (refillable) of Sani-Spray liquid goggle cleaner, a supply of tissue paper and a built-in receptacle for used cleaning tissues. Simple push button-control releases a fine mist of Sani-Spray from an orifice



on one side of the cabinet, pressure being provided by connecting to plant ariline. Adjustable control valve regulates amount of spray applied to goggles. All contents of cabinet are tamper-proof under lock and key. Compact size requires minimum wall space. Claimed to be easy to use, to step up production and to reduce hazards created by cloudy goggles. Cleaner not only cleans but also fog-proofs goggles.—**Allen Optical Co., Buffalo 2, N. Y.**

HOLDING UP THE "BREAKDOWN" CURVE—

Lubricating oils do not wear out—they break down chemically. Shell postpones this breakdown in Talpex by four important refining steps.



THESE 4 TALPEX PERFORMANCE FACTORS SAFEGUARD HIGH-SPEED DIESELS

1.

Talpex is protected by the removal of the oil's natural liabilities—those oil components that readily oxidize. Shell does this by means of a special solvent-extraction process.

2.

Talpex is protected with an anti-oxidant that effectively serves to still further retard the formation of corrosive compounds and objectionable sludge and lacquer.

3.

Talpex has effective corrosion-preventive properties which are obtained by special refining methods. This means better performance and longer life of the engine's wearing parts.

4.

Talpex has detergent properties that keep carbon, lacquer and rust particles from adhering to pistons, rings, valves and ports—keeps these contaminants "moving" until drained from the engine.

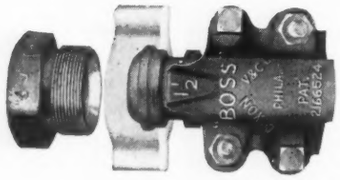
The Shell Lubrication Engineer will give you sound advice about the lubrication of *any* type of Diesel, whether slow, medium, or high-speed. Write for a copy of Shell's booklet, "The Fundamentals of Diesel Lubrication." Shell Oil Company, Incorporated, 50 West 50th Street, New York 20, New York or 100 Bush Street, San Francisco 6, California.

SHELL

SHELL DIESEL LUBRICANTS

Extra Strength, Durability and Safety... for Every High or Low Pressure Hose Connection!

The three "Boss" Couplings described below will meet every requirement for efficient, long-life service on all steam, air and fluid hose lines.



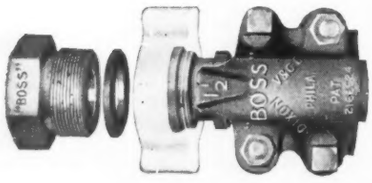
"G J-BOSS"

Ground Joint, Style X-34
FEMALE HOSE COUPLING

Extensively used in pile-driving, grouting, hydraulics and general heavy construction. Ground joint connection provides washerless, leakproof, soft-to-hard metal seal between stem and spud. Large Wing Nut facilitates coupling and uncoupling. Corrugated stem assures maximum holding strength. Sizes ½" to 4", inclusive. Furnished with male or female spuds.

"BOSS" MALE COUPLING STYLE MX-16

Companion to both ground joint and washer type female couplings. Strongest and safest of its kind for all applications, including oil, butane, ammonia, etc. More convenient and economical than regular iron pipe nipples, as each size fits same size straight end hose. Can be quickly reset on the job. Sizes ¼" to 4", inclusive.



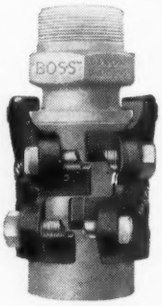
"BOSS"

Washer Type, Style W-16
FEMALE HOSE COUPLING

Same as "G J-Boss" coupling described above, except that it is designed for washer instead of ground joint seal between stem and spud. Stem is full length, to assure ample support for hose under clamp area. Sizes ¼" to 4", inclusive. Male or female spuds.

"BOSS" OFFSET AND INTERLOCKING CLAMPS

Exclusive with DIXON, and furnished on the three "Boss" Couplings shown here. Bolt lugs and dove-tailing fingers, instead of being in alignment, are set in staggered or offset relation to each other, causing the clamp to grip evenly and securely over the entire circumference of the hose, without pinching. A forward extension on each clamp section engages collar on coupling stem. All possibility of a straight-line leak or blow-off is eliminated.



Carried in Stock by Manufacturers and Jobbers of Mechanical Rubber Goods.

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VALVE & COUPLING CO.
Main Office and Factory: PHILADELPHIA, PA.
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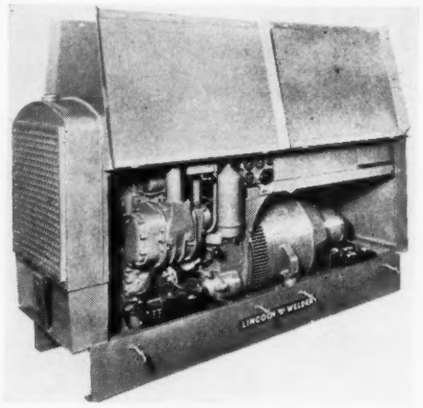
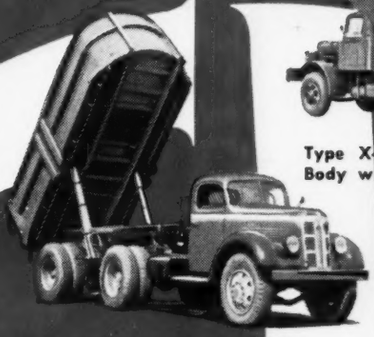
DIESEL-ENGINE-DRIVEN WELDER of 300-amp. capacity is equipped with dual continuous control which permits operator to select any type arc and any arc intensity. Engine features simplified fuel arrangement with complete fuel filtering system. Welding generator has separate excitation and laminated magnetic circuit for smoother, more



productive arc. Current range for welding duty is from 20 to 40 v., 60 to 375 amp. Generator control can be adjusted in continuous sequence of five steps by means of shunt field rheostat. All control parts are contained in steel cabinet. Stationary model weighs 2,560 lb. and can be mounted on wheels, trailer or truck.—**The Lincoln Electric Co., Cleveland 1, Ohio.**

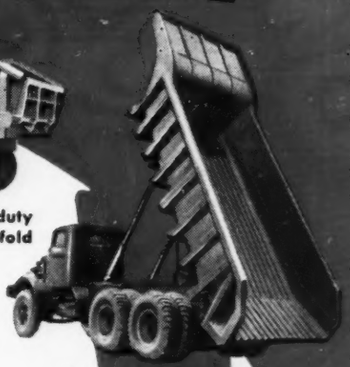
BETTER BUILT FOR BEST PERFORMANCE

One way side dump Body with dual telescopic Hoist. Automatic downfold sides.

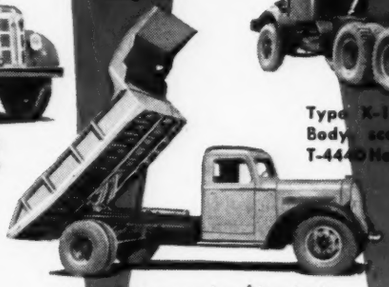


Type Q12 Body with Model T440 dual telescopic Hoist. Capacity 16 cu. yds.

Type X-112 Extra heavy duty Body with automatic downfold tailgate.

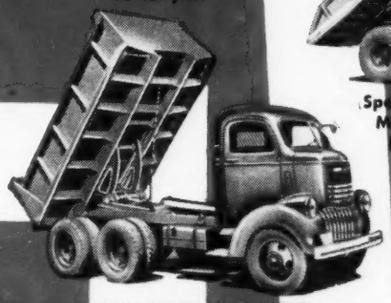


Type X-112 Extra heavy duty Body scoop end with Model T-444 Hoist. Capacity 19 cu. yds.

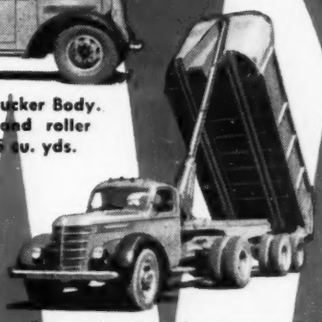


Special scoop end mucker Body. Model F8B cam and roller Hoist. Capacity 5 cu. yds.

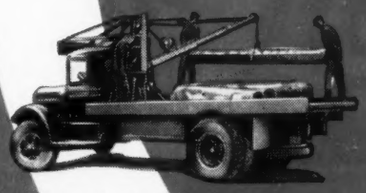
Rock excavating Body with downfolding gate.



Type W12 Body—Model F4C cam and roller Hoist. Capacity 6 cu. yds.

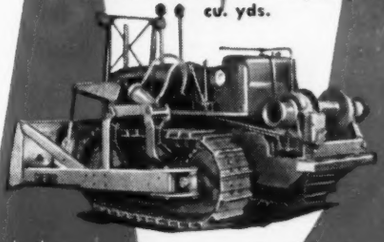


Type W12 Body front recessed for Model TV83 Hoist. Capacity 15 cu. yds.



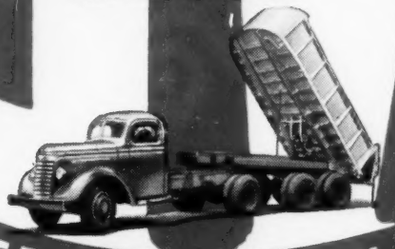
Telescopic boom Crane. Radius 8 to 20 feet.

Type C12 Body and Model D6 or D7 Hoist. Dumping angle 55°.

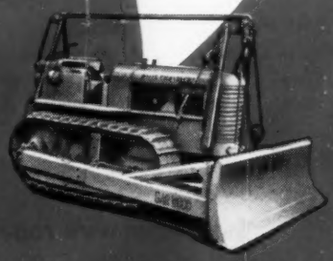


Bulldozer and rear mounted Winch.

Type W12 Body and single telescopic Hoist. Double acting tail-gate Capacity 4 cu. yds.



West Coast Special W-12 Body. Model FBC cam and roller Hoist. Capacity 10 cu. yds.



Cable Bulldozer with angling blade.

TRADE MARK

GW TRADE MARK

GAR WOOD INDUSTRIES, INC.

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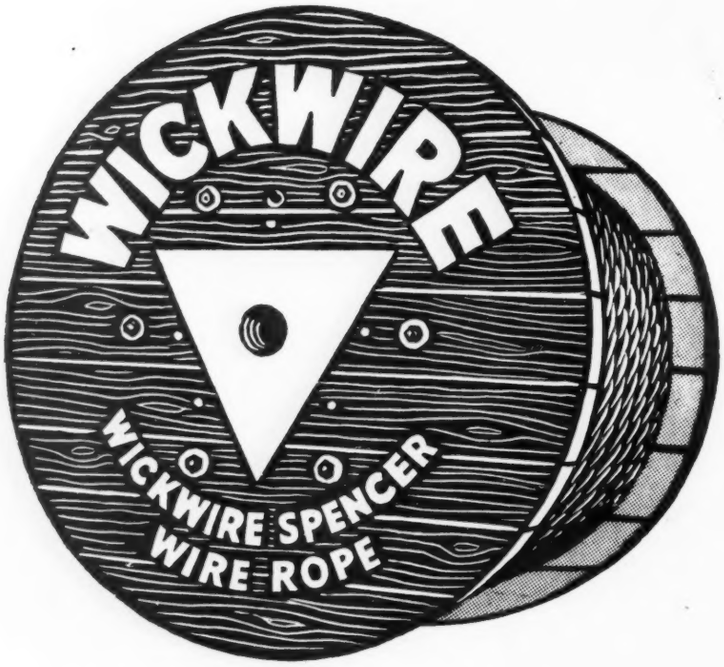
WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

OTHER PRODUCTS: TANKS • HEATING EQUIPMENT • MOTOR BOATS



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For rugged, long-lasting wire rope be sure it bears the name Wickwire Spencer. Every step in the making of Wickwire Rope is under constant, careful control, from the special formulae used in making the steel, through processing of the wire until it is exact within a fraction of a thousandth of an inch, through laying of the strands and final closing.

Order Wickwire Spencer Wire Rope and be assured of the utmost in performance, safety and long rope life. It is available in all sizes and constructions—both regular lay and WISSCOLAY *Pre*formed.

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Thousands of wire rope users—old hands and new—have found "Know Your Ropes" of inestimable value in lengthening life of wire rope. Contains 78 "right and wrong" illustrations, 41 wire rope life savers, 20 diagrams, tables, graphs and charts.

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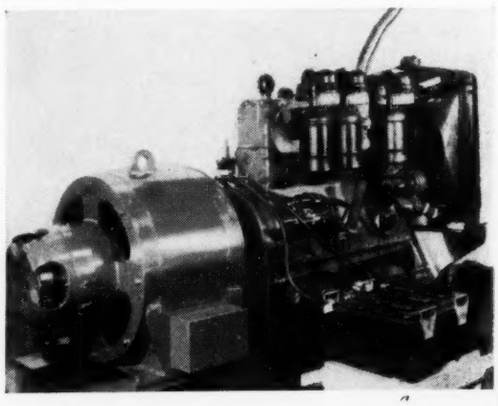
FIELD-TYPE GENERATORS are now available in sizes from 5 kw. through 100 kw. and may be designed to take care of special requirements. Generator illustrated is rated at 50 kw. at 80 percent P.F., 62.5 kva. at 1,200 rpm. Designed

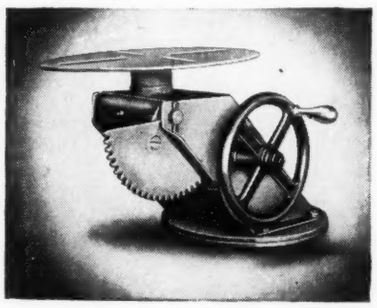


to furnish 127 to 220 v. ac., 60-cycle, 4-wire, but is available for standard voltages and frequencies. Generator shown is directly coupled to a 95-hp. Cummins diesel engine, one of many applications for Kato generators.—**Kato Engineering Co., Mankato, Minnesota.**

FRICTION ELIMINATOR, named "Slipit" is new jelly-like compound, which, when applied to sticking windows, doors and desk drawers, leaves a hard, long lasting slippery surface enabling them to work without interference. Brushed, or rubbed on. Slipit helps to prevent swelling of wooden parts. Said to be excellent for application to newly painted windows, to gather minimum of dust and dirt and to be harmless to fine finishes, clothes or hands. One application claimed to last a year.—**Slipit Products Co., 169 Water St., New York City.**

RUNNING-TIME RECORDER for checking machine performance keeps track of operating or "on" time of construction units, trucks and similar equipment. Chart record shows total "on" time in hours, minutes and seconds for a given period. "Off" periods also are shown on chart as well as time at which they occurred. Running time readings are magnified in such a way that total operating time of machine can be easily and accurately determined to within a few seconds.—**The Bristol Co., Waterbury 91, Conn.**

BENCH MODEL POSITIONER has 100-lb. capacity with center of gravity 3 in. above table. It has tilting range of 150 deg., revolves 360 deg., and can be locked in position at any degree of tilt.



It is especially adaptable to stelliting and other hard-surfacing of worn-out construction equipment parts. Its 16-in. table top is equipped with 9/16-in. slots. Swivel base is available.—**Ransome Machinery Co., 120 Rock Ave., Dunellen, N. J.**

THIS UNIT REALLY GOES PLACES AND DOES THINGS

Speed is an outstanding feature of the new, powerful postwar Lorain Moto-Crane.

Speed in getting from job to job—up to 31 m. p. h. on hard surfaces—and remarkable soft-ground flotation for covering territory off the road.

Speed, too, when it's on the job excavating with clamshell or shovel, trenching with hoe, tossing a dragline, or handling materials with crane hook.

These fast, agile, rubber-tired Lorain Moto-Cranes also have greater capacity for bigger payloads and increased stability for long boom, wide radius swing.

Lorain Moto-Cranes are six wheel units with 4 or 6-wheel drive. See them in action, and let your nearest Lorain distributor explain their many other profit-making features.

GET THE FACTS and YOU'LL GET A...

Reg. Trade Mark

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MAKE ONE BEARING

OUTLIVE TWO!

LUBRIPLATE Lubricants actually condition bearing surfaces and stop progressive wear. They prevent rust and corrosion and resist steam, hot water, many acids and other adverse conditions. LUBRIPLATE is in a class by itself. Use it and make one bearing outlive two. Write or phone for facts and figures.

℞ FOR YOUR MACHINERY

No. 3 — Ideal for general oil type lubrication, ring oiled bearings, wick feeds, sight feeds and bottle oilers.

No. 8 — Because of high film strength and long life it reflects outstanding performance in most types of enclosed gears (speed reducers).

No. 107 — One of the most popular grease type products for general application by pressure gun or cups.

No. 70 — For a wide range of grease applications, especially at temperatures above 200 degrees F.

No. 130-AA — Known nationwide as the superior lubricant for open gears, heavy duty bearings, wire rope, etc.

BALL BEARING — This is the LUBRIPLATE Lubricant that has achieved wide acclaim for use in the general run of ball and roller bearings operating at speeds to 5000 RPM and temperatures up to 300 degrees F.

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FISKE BROTHERS REFINING CO.

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DEALERS FROM COAST TO COAST

CONSULT YOUR CLASSIFIED TELEPHONE BOOK

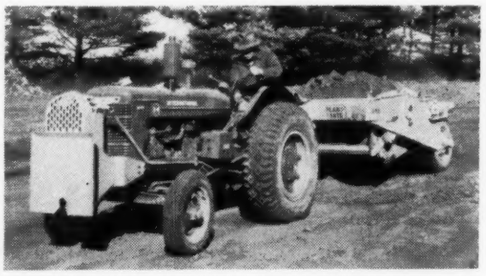
YOU CAN INCREASE LIFE EXPECTANCY OF ANTI-FRICTION BEARINGS

While manufacturers and users of all types of machinery base operating cost figures on a definite period of time, over which they can safely predict that their equipment will operate, they fully realize the economy that will result from increasing the "life expectancy" of bearings. Ball and Roller Bearings represent a sizable investment. In order to secure a paying return on the investment, considerable care must be exercised in installation and in lubrication. Manufacturers and users of anti-friction bearings have been able to increase the life expectancy of their bearings by the use of LUBRIPLATE Lubricants. There is a reason for this phenomena. Through long and careful research, the manufacturers of LUBRIPLATE have been able to combine all those desirable qualities that are vital to the continuous operation of anti-friction bearings.

LUBRIPLATE Lubricants stay put when applied. They don't drip away nor are they dissipated at high temperatures. LUBRIPLATE maintains an extra protective lubricating film on bearing surfaces at all times and prevents them from scoring. Since LUBRIPLATE sheds water, it provides that necessary protection against the destructive forces of rust and corrosion. A comparatively small amount of LUBRIPLATE does the job—making it economical as well as long lasting. A durable LUBRIPLATE "film" keeps metal surfaces apart, no matter how heavy the load nor how high the speed, and reduces heat and friction, the exponents of wear, to a minimum. Bearings thus retain their newness longer.

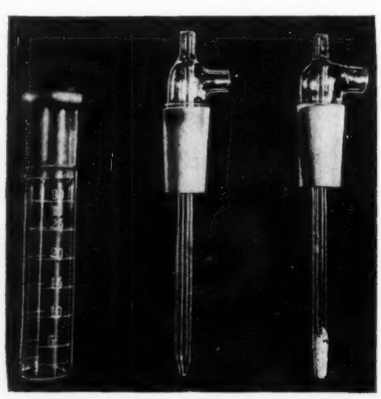
Specially developed to meet the operating requirements of anti-friction bearings, BALL BEARING LUBRIPLATE provides cool and quiet performance for grease type bearings operating at speeds up to 5000 R.P.M. and temperatures to 300° F. For conditions other than above, consult the LUBRIPLATE recommendation chart. Write for a copy of the "LUBRIPLATE SERVICE HANDBOOK" containing valuable information on the subject of lubrication of anti-friction and other bearings.

2-YD. FRONT-DUMP SCRAPER, Model CW-2, is improved industrial counterpart of wartime airborne scraper which was used in large numbers by Airborne Engineers for clearing roads and airstrips in inaccessible regions. Two rear wheels can be located either inside or outside cut and it can make a full 90-deg. turn or less within a circle of 20-ft dia. Hitch is designed for operation behind high-speed rubber-tired industrial tractors. When fully loaded, weight is lifted from tractor's front wheels and much of it centered on driving wheels for maximum traction. Bowl and apron



are operated hydraulically by airborne pump. Three-position valve enables cutting edge to be held in position and exerts effective down pressure. Other operating features include ability to make cuts up to 11½ in., and to load all scraper material without aid of pusher or from overhead. Due to low center of gravity, scraper will not roll over on any slope that will hold tractor. Rubber tire equipment is designed for high road speeds, but it can be used on or off pavements for hauling. Bowl clearance and short wheel base allow its use on soft fills or rough terrain. Because of these operating features, this scraper can be used in construction of small dams and ponds, on farms and stock ranges; for construction and maintenance of village and city streets; for back-filling bridges and foundations; for grading and landscaping in parks, golf courses and cemeteries; for cleaning ditches along highways, clearing slides, leveling dumps and small earthen prominences, and for general earth haulage. Weight, 2,550-lb.—**LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.**

ALL-GLASS SAMPLING UNITS, for use in dust sampling, consist of flask and nozzle with standard taper ground-glass stopper. A fitted glass bubbler also is available. This equipment makes possible sampling of variety of dusts, gases and vapors. All-glass construction of new units permits easy and thorough cleaning and prevents contamina-



tion or discoloration of sample undergoing test. Air outlet is placed at maximum height, and possibility of drawing over any of the collecting fluids is practically eliminated. Impinger nozzle orifice is fixed at correct height, no readjustment being necessary. Each nozzle has been checked to insure flow of within 4 percent of 1/10 cu. ft. per min. at 12-in. water vacuum, according to manufacturer.—**Mine Safety Appliances Co., Braddock, Thomas and Meade Streets, Pittsburgh 8, Pa.**

Train Apprentices Right with faster-working SKILSAW

... the way they do in Cleveland, Ohio

Veterans Learn Building Trade and Help Bud
By WILLIAM BEROUT
This is a story about some returned war veterans who are learning the business of building homes to house some of the veterans who have not yet come home.
It's a story of the building trades and what this trade is doing to re-establish the returned war heroes.
The four char-
acters

Photographs from the Cleveland PRESS

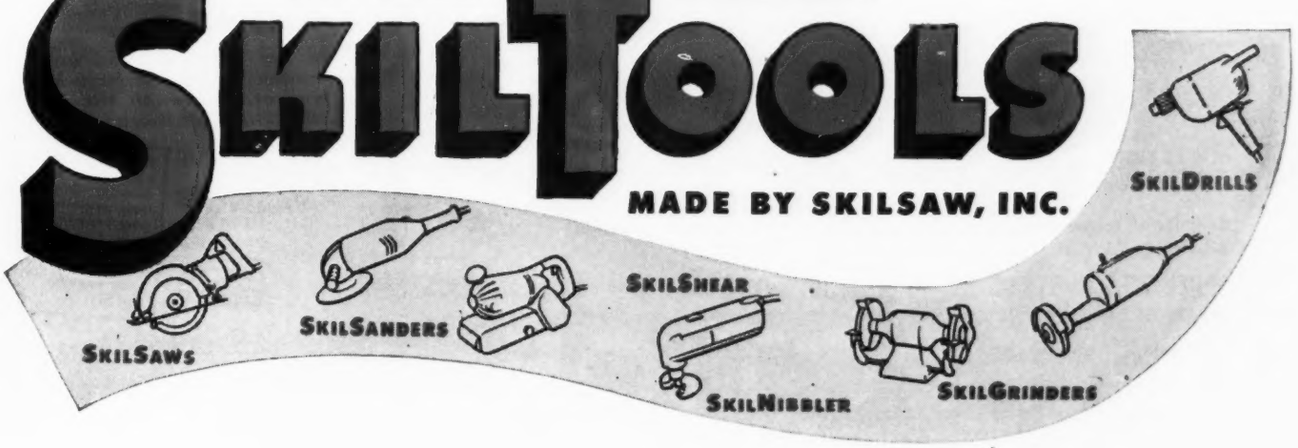
● Apprentices learn modern building methods quicker . . . become productive for you at once when you train them with SKILSAW right from the start. One apprentice with a SKILSAW can keep 6 veteran carpenters busy laying-in and nailing. Ask your distributor to show you the many ways to save time and money with SKILSAW on every cut in construction work.

SKILSAW, INC.
5033-43 Elston Ave., Chicago 30, Ill.
Factory Branches in all Principal Cities

PORTABLE ELECTRIC

SKILTOOLS

MADE BY SKILSAW, INC.



Which Gives-- More Efficient Lifting?

ONE FINGER

Concentration of power thrust in a small area increases strains of unbalanced loads. It requires more effort--and produces excess wear on a hoist and body.

OR

Power thrust uniformly distributed throughout entire length and bredth of frame decreases strains of unbalanced loads--and minimizes wear on hoist and body.

A WIDESPREAD HAND

NOTE

With PERFECTION'S scientific understructure construction, the power thrust from the hoist is delivered--not to a single bolster or small cross-member directly against the floor of the body--but first to the longitudinal sills which distribute the thrust to ALL bolsters. It is largely because of this superior design that PERFECTION'S record of performance and service is an enviable one.

PERFECTION'S "Balanced-Power-Thrust" construction is standard on all stake and dump body styles with double compound lift arm hoists.

Built for all makes and models of trucks. Write for Bulletin and names of nearest Distributors.

THE PERFECTION STEEL BODY COMPANY GALION, OHIO

PERFECTION

TRUCK BODIES AND HOISTS

STOCK HANDLING CART is designed to save steps and material handling in stockrooms, toolrooms, shipping departments, and other operations. Model 2000-11 is 30 in. long, 16 in. wide and 32 in. high

overall. Also available are extra center tray and desk accessory, which is 16 in. wide and 14 in. deep with 5 deg. slope. Cart is finished in green baked enamel and is shipped set up.—**Lyon Metal Products, Inc., Aurora, Ill.**

NEW RUBBER CEMENT, named Plastilock 500, is non-thermoplastic, water and aromatic-oil resistant adhesive for bonding metals, wood, plastics, and ceramic materials to themselves or to each other. In some cases it can be used in place of rivets or screws. When used for metal-to-metal bonding it has shown shear strength of 3,250 psi. Tension strengths of 4,000 psi. have been reached. Best results are gained by applying heat with pressure, though heating alone will give some degree of adhesion.—**The B. F. Goodrich Co., Akron, Ohio.**

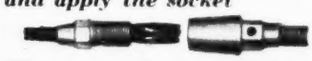
GOES ON IN NO TIME

HANGS ON FOR ALL TIME

...this Electroline FIEGE WIRE ROPE CONNECTOR

See how easily it goes on—simply slide the sleeve on the cable, spread the strands

insert and drive in the plug and apply the socket



Then see what a solid and permanent joint you have by looking at it through the inspection hole put there for the purpose.

This better connector damps vibration, prolongs wire rope life; is in fact the STRONGEST PART of a wire rope assembly.

Electroline Company

4121 SOUTH LASALLE STREET
CHICAGO 9, ILLINOIS

Excavate at New Low Cost with INTERNATIONAL Tractors

THE use of International Diesel TracTracTors for digging basements and other excavations is a distinctly advanced practice. Costs are lowered materially; the work is speeded; time is saved. Many operators who have specialized in excavation work with TracTracTors enjoy a remarkable volume of business because of these advantages.

In homesite subdivision developments, whole blocks of basements are often excavated in one operation by a single International Crawler!

The International TD-14 TracTracTor shown in the photographs is owned by a basement specialist in the midwest. At this particular site, it was excavating 420 cubic yards of clay. Average depth was 6 feet. Average distance from cut to spoil was 60 feet. Time required to complete the excavation was 6½ hours. Total cost for fuel, lubricants, operator's and helper's wages was under $15.00. The tractor arrived in the morning, finished the job in the afternoon and was on its way to the next job before the day's end!

International Diesel TracTracTors are instant-starting, fast-working and dependable crawlers that get work done at lowest cost and keep going month after month with minimum maintenance. Visit the International Industrial Power Distributor near you for further information about International Tractors and Engines. Check up on the new units and matched equipment now available.

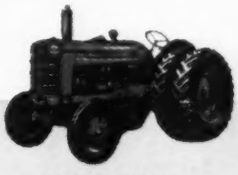
Industrial Power Division

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue **Chicago 1, Illinois**

TRACTRACTORS

POWER UNITS



WHEEL TRACTORS

INTERNATIONAL INTERNATIONAL HARVESTER **Industrial Power**

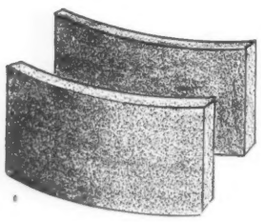
Famous Stops

JOHN L. SULLIVAN

IN THE LAST BAREKNUCKLE CHAMPIONSHIP BOUT EVER FOUGHT, STOPPED JAKE KILRAIN IN THE 75TH ROUND. THE CONTEST WAS HELD IN RICHBURG, MISS., ON JULY 8, 1889.

BOULDER DAM

STOPS THE COLORADO RIVER TO PROVIDE ONE OF THE WORLD'S GREATEST SOURCES OF HYDRO-ELECTRIC POWER. TALLEST OF THE WORLD'S GIANT DAMS, IT PRODUCES SOME 4,330,000,000 KILOWATT-HOURS OF POWER ANNUALLY.



FAMOUS FOR SURE STOPS

AT ALL TIMES ARE JOHNS-MANVILLE INDUSTRIAL FRICTION MATERIALS. AVAILABLE IN A WIDE VARIETY OF FLEXIBLE AND RIGID STYLES, THESE FRICTIONS "GO TO WORK"... ON SWINGS, CROWDS, HOISTS AND BRAKES... TO GIVE YOU THE MAXIMUM CYCLES PER MINUTE ON YOUR EQUIPMENT. JOHNS-MANVILLE, 22 EAST 40TH STREET, NEW YORK 16, N. Y.

JM PRODUCTS

Johns-Manville

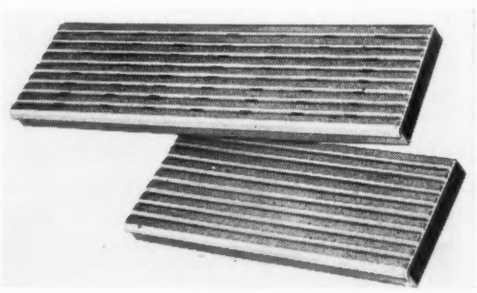
INDUSTRIAL FRICTION MATERIALS

SAFETY VALVE for high-pressure air hose eliminates whipping action that results when air hose breaks or connection fails. Valve closes line when flow of free air exceeds predetermined amount. It is set to allow up to normal air flow required for tool operation. Is installed immediately ahead

of upstream end of supply hose. No adjustments are necessary. Standard model is designed to close when air flow exceeds 100 cfm. of free air with supply at 85 psi. It will deliver this flow through 3/4-in. hose up to 100 ft. in length. Models are available for other pressures and capacities.—**Associated Valve & Engineering Co., 510 N. Dearborn St., Chicago 10, Ill.**

READY-MIXED PAINT called "Mason-cote," for coating exterior masonry surfaces, has unusual feature of going over damp brick, concrete, cement, stucco and cinder block. Claimed to have exceptional adhesion and to be unaffected by temperature extremes. Features: (1) Ready-mixed for use—easily applied by brush or spray; (2) no saponification caused by masonry alkalinity; (3) supplied in white only—easily tinted with lime-proof oil colors; (4) excellent adhesion to masonry—unaffected by temperature extremes; (5) does not become brittle; (6) excellent hiding quality—one coat covers light colored surface; two coats, dark colored surface.—**The Wilbur & Williams Paint Corp., Boston 16, Mass.**

ALL-STEEL SAFE GROOVE TREAD AND STAIR STEP, suitable for construction of steel stairs of open steel riser types, is bolted or welded to steel stairs of open steel riser types, is bolted or welded to steel stringers which makes it unnecessary on many jobs in specific types of buildings to construct steel sheet pan type stairs with disadvantage of dead load of concrete. This type of stair construction has safety tread integral with steel step,

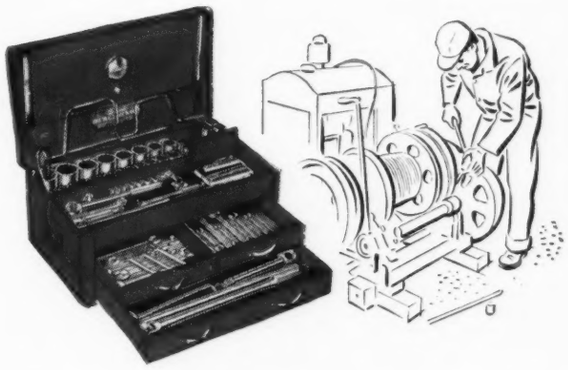


whereas on ordinary stair construction, such as concrete-filled stairs, safety tread must be applied to concrete to afford a like measure of protection. This tread is suitable for fire escapes and stairways in power plants, industrial buildings, warehouses, subways, industrial loft buildings, chemical plants, freight houses and wherever stairs of steel construction of the ordinary type are standard. Affords a firm, secure foothold because grooves and tread surface are comprised of non-slip, abrasive grip filler. Safety grooves are interlaced with slots which permit ready drainage thus keeping treads free of clogged materials and making them practically self-cleaning.—**Wooster Products, Inc., Wooster, Ohio.**

Blackhawk Products are Basic in CONSTRUCTION and MAINTENANCE

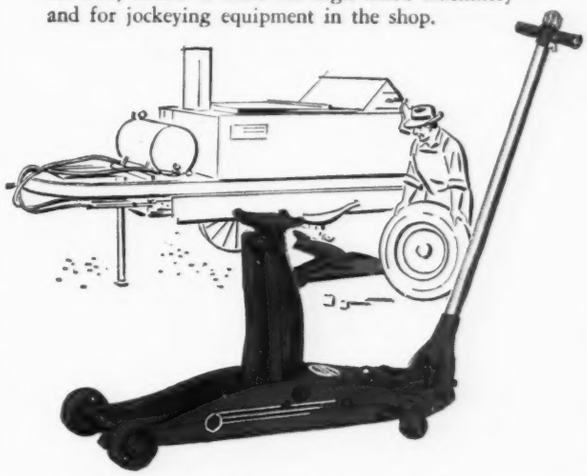
Blackhawk Socket Wrenches

— in a complete range — give you exclusive combinations of handles, sockets and attachments that speed work — Blackhawk Wrenches with patented thumb release "Lock-on" create *extra* safety and more dependable performance.



Blackhawk Hydraulic Service Jacks

— are indispensable in the shop or on the job. Sure, fast, 24" lift of the Blackhawk S4, with EXCLUSIVE features, makes it ideal for high axled machinery — and for jockeying equipment in the shop.



Porto-Power

EXCLUSIVE — is literally an all-purpose tool. It pushes, pulls, bends, clamps, presses and straightens — with tons of power. This safe, easily transported, remotely controlled hydraulic jack provides on-the-spot hydraulic power to lick 1001 tough jobs.

Blackhawk Hydraulic Jacks

— meet the demands of construction work with an unequalled "service proved" record of dependability, performance and freedom from maintenance. Powerful, fast acting, Blackhawk Jacks are real time savers on the job.

ONE-MAN OPERATED
Even the 50-ton Blackhawk jack can be carried and operated by ONE MAN.

THE blistering pace of construction will require the best in fast working, modern tools. Unmatched versatility, speed and dependability of Blackhawk Products make them key tools for you. This multi-purpose equipment serves in every phase of construction and maintenance work. These modern, quality Blackhawk tools are built tough and rugged to stand the gaff. They're basic design is different, making them tops for speed and utility. For complete information on Blackhawk Products write us or see your Blackhawk Equipment Distributor. BLACKHAWK MFG. COMPANY, Dept. M2336, Milwaukee 1, Wisconsin.

BLACKHAWK

Always fast-priming

. . . and non-leaking

Even after hundreds of hours of toughest service, water is kept in and air out as effectively as when new because the seal rings are made of Tungsten Carbide, a material so hard it cuts glass like a diamond. There's no loss of vacuum, so high priming efficiency is constantly maintained. The performance of every Carver pump is carefully checked in our testing laboratories to make sure that it meets our high standards for performance on the job. The "Certified" tag is your assurance of peak performance on your toughest jobs. Carver pumps are available in a wide range of sizes from 1½" to 10". For details see your Carver dealer.

THE CARVER PUMP CO.
Muscatine, Iowa

CARVER CENTRIFUGAL
Certified **PUMPS**

NEWS FROM MANUFACTURERS

About Their Products

The publications reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

CONTROLLING HIGHWAY ACCESS—**Public Roads Administration,** Washington 25, D. C. (46 pp., illustrated) Discusses legal issues involved when access to streets and highways is restricted to improve travel for through traffic and points out that nearly all states and cities have adopted traffic control regulations and highway designs which limit property owners' freedom of movement on traffic-ways adjacent to their property.

LIGHT-REFLECTING CONCRETE FLOOR — **Universal Atlas Cement Co.,** Chrysler Building, New York City (24 pp., illustrated) Revised edition of this booklet, re-edited and rearranged for the reconversion period, includes source material prepared in collaboration with authorities on illumination, design and construction. Floors built with white portland cement are depicted as giant reflectors of light; those built with gray cement or darker materials as giant absorbers of light. Amount of reflection from white floor is sufficient, it is claimed, to make seeing easier, quicker and more comfortable, and thus increase production, reduce accident, lift morale and improve health. Sections of book are devoted to recommended practise for floor construction surface treatment and maintenance.

HEAVY-DUTY MOTOR OIL—**Standard Oil Co.** of Indiana, 910 S. Michigan Ave., Chicago 80, Ill. (42 pp., illustrated) The history of the development of Stanolube HD for the lubrication of heavy-duty gasoline and high speed diesel engines, the nature and significance of these heavy-duty problems and how this motor oil can be most effectively applied to their solution are presented in this booklet. This oil was especially designed to meet the tough lubrication problems inherent in automotive equipment operating under the most severe conditions of load, speed and temperature. These problems are primarily varnish formation, objectionable engine deposits, ring sticking, bearing corrosion and filter deposits.

SNOW MELTING—**A. M. BYERS CO.,** Pittsburgh, Pa. (6 pp., illustrated) Consolidates information on installations since 1925 of underground hot water or steam wrought iron pipelines. Specific information is given on five installations: Beneath sidewalk of office building; in residence driveway; beneath crosswalks in industrial plant; in truck driveway; and in truck ramp at factory.

Red Lead
NEUTRALIZES ACIDS
that Speed Up Rusting

Every maintenance engineer knows that Red Lead has long been the outstanding protective paint for metal.

But did you know that one of the important reasons is the ability of Red Lead to counteract the acid conditions which are recognized as accelerators of rust?

Structural steel is usually exposed to acid environments. This is so because acid-forming compounds are produced by certain gasses and smoke in contact with moisture. Pollution of waterways also results in acidity.

Moreover linseed oil, synthetic resin varnishes and other commonly used paint vehicles *themselves* produce organic acids in the normal process of aging. Many of these also accelerate corrosion.

When Red Lead is the pigment in a protective paint, rust-causing acidity is kept under control. Actually, a "controlled" acid level is maintained in the paint film. This is a singular property of Red Lead and also contributes to the utmost in film flexibility, impermeability and long life.

* * *

The value of Red Lead as a rust preventive is most fully realized in a paint where it is the only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint. No matter what price you pay, you'll get a better paint for surface protection of metal if it contains Red Lead.

* * *

Write for New Booklet—"*Red Lead in Corrosion Resistant Paints*" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel. It describes in detail the scientific reasons why Red Lead gives superior protection. It also includes typical specification formulas. If you haven't received your copy, address nearest branch listed below.

* * *

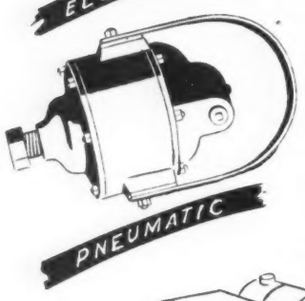
The benefit of our extensive experience with metal protective paints for both underwater and atmospheric use is available through our technical staff.

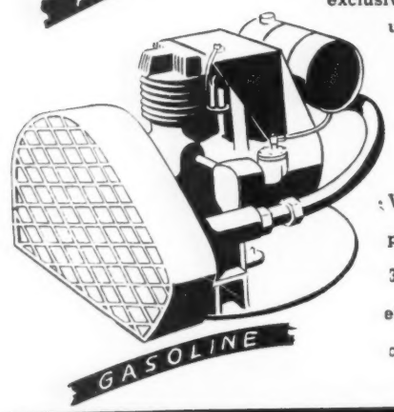
NATIONAL LEAD COMPANY: New York 6; Buffalo 3; Chicago 80; Cincinnati 3; Cleveland 13; St. Louis 1; San Francisco 10; Boston 6, (National Lead Co. of Mass.); Philadelphia 7, (John T. Lewis & Bros. Co.); Pittsburgh 30, (National Lead Co. of Pa.); Charleston 25, W. Va. (Evans Lead Division).

Dutch Boy
Red Lead

FOR THE LOW BIDS

AHEAD ... On Concrete Construction Get Set WITH Viber HIGH SPEED INTERNAL Viberation





VIBER high-speed Vibrators are the WORLD'S Number-one choice—proved by their use on most major construction jobs. And if you've ever owned or operated Viber's you know why they're favorites. They save you money—in first cost, operating cost, maintenance cost.

They are reliable, durable, simple and easy to service. The workmen like to work with Vibers, because of their easy-to-carry light weight portability, they can do more work per hour.

Turn YOUR attention now to the high speed development (over 9500 RPM in concrete) and other exclusive features which will keep you as a Viber user safely beating schedules on job after job!

3 Kinds of Power

Viber offers 3 types of power units—electric, pneumatic, gasoline. All are adapted to use 3-inch, 2⅛-inch and the new 1¾-inch diameter heads. Viber-designed flexible casings are in 6-, 12-, and 21-foot lengths.

Ask your equipment dealer about the many new advantages offered in a Viber. He can make immediate delivery too.

VIBER COMPANY

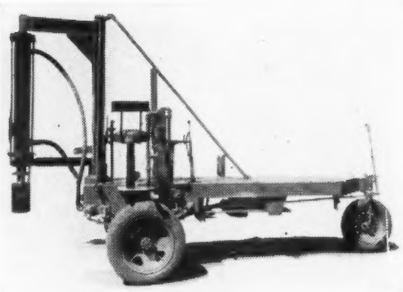
EST. 1931

726 South Flower Street
BURBANK, CALIFORNIA

ORIGINATORS OF INTERNAL CONCRETE VIBRATION

ELECTRODES — **Air Reduction,** 60 E. 42nd St., New York 17, N. Y. (56 pp., illustrated) Covers entire line of Airco electrodes for welding mild steel, alloy steels, stainless steels, galvanized sheet steel, aluminum and other non-ferrous metals and for hardfacing, together with complete descriptions and details of applications, welding procedure, mechanical properties, chemical analyses and specifications. Various types of fillet welds made with many of the electrodes catalogued also are illustrated and a reference section offers information on such subjects as "Plate Edge Preparation," "Estimating Electrode Requirements," "Welding Symbols," "Hardness Conversion Table," and "Glossary of Welding Terms." Contains a combined electrode selector chart and index, and illustrated sections on mechanical properties and testing and on approvals.

DYNAMOMETER—**W. C. Dillon & Co., Inc.,** 5410 W. Harrison St., Chicago 44, Ill. (20 pp., illustrated) Presents complete story of traction-type dynamometer and uses which are being found for it in simplifying testing and weighing procedures in many industries. Furnishes specifications and prices for nine different capacities.



Junior

RAPID PAVEMENT CONCRETE BREAKER

Fastest Pneumatic Method
Cuts Cost and Time
Works Inside or Out
Vertical or Horizontal
Good for all Small Jobs

Ask about our

HEAVY-DUTY TYPE

RAPID PAVEMENT BREAKER COMPANY

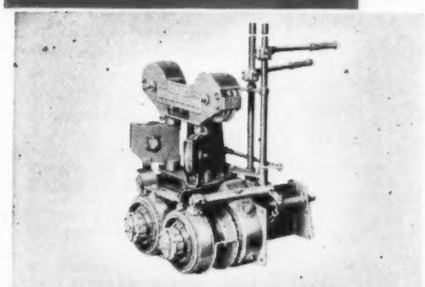
1517 Santa Fe Ave. Los Angeles 21, Calif.

FAST-LOADING

HEIL CABLE SCRAPERS

move more dirt per hour ... at less expense

Heil Bodies and Hoists operate smoothly, dump loads quickly, and save on maintenance costs.



Heil Power Control Units give you fingertip control plus lightning-fast response.

With Heil Cable Scrapers, you *load easier* because of the rapid raising and lowering of the bowl and the pivot-point location which places the weight of the scraper on the cutting bit — for better soil penetration.

You *haul more yards* because the correct bowl design follows the natural contour of boiling dirt —no voids or waste—bonus loads every time. You *unload faster* because Heil's tilting-floor, mechanical-push-out action requires less cable pull, wipes clean, discharges evenly and completely.

Heil engineering gives you rugged, all-welded construction and an all-around design that assures easier maintenance, simpler field repairs, and economical operating costs. Write for bulletin.

See your nearby Heil distributor.

B-63

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

Featuring the popular type "D" system of unit packaging, M.S.A. First Aid Kits provide in compact, ready-to-use form, the essential treatments called for when accidental injuries occur. Each unit package contains one or more complete treatments—ready for instant use, simple to apply, avoiding waste and lost motion. All dressings are greatly compressed to save space; all liquids hermetically sealed to avoid loss by leakage or evaporation. The standard fills of M.S.A. First Aid Kits cover all average requirements, yet can be varied for special needs. The sturdy steel cases are equipped with a dust and moistureproof gasket seal, two snap locks and brackets for mounting on wall or vehicle. Write for informative bulletin!

M.S.A. First Aid Kits are available in 10-, 16-, 24-, and 36-unit sizes, covering all service requirements.

MINE SAFETY APPLIANCES COMPANY
BRADDOCK, THOMAS AND MEADE STREETS · PITTSBURGH 8, PA.
District Representatives in Principal Cities
In Canada: MINE SAFETY APPLIANCES COMPANY OF CANADA, Ltd.
TORONTO, MONTREAL, VANCOUVER, CALGARY, NEW GLASGOW, N.S.

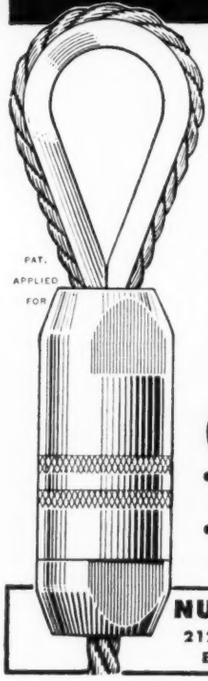
FUEL INJECTION NOZZLE—**Ex-Cell-O Corp.,** 1200 Oakman Blvd., Detroit 6, Mich. (12 pp., illustrated) Describes operation of nozzle and how it works in relation to diesel and gasoline engines. Contains numerous photographs and cross-sectional drawings.

CEMENT GUN OPERATIONS—**Cement Gun Co.,** Allentown, Pa. (72 pp., illustrated) This bulletin describes and illustrates various jobs performed by the machine manufactured under the trade name "Cement Gun." "Gunite," the trade name of the sand-cement mixture placed with the cement gun possesses properties that make it particularly adaptable for building wall and roof construction; protection of steel from fire corrosion and locomotive blasts; lining reservoirs and canals; repairing masonry or concrete structures; construction of new water tanks; roof and rib protection in mines and many other types of work. Qualities of Gunite are listed and described: (1) Adhesion; (2) density; (3) strength; (4) modulus of elasticity; (5) resistance to percolation; (6) low water-cement ratio; (7) expansion; (8) compression and other values of Gunite. Job applications described and pictured: (1) Building construction; (2) concrete repairs; (3) railroad repairs; (4) dam reintegration; (5) construction of new dams and revetments; (6) reservoirs; (7) swimming pools; (8) canals. pipe lines and sewers (9) prestressed tanks; (10) steel encasements; (11) piling; (12) stacks and bunkers; (13) mines; (14) refractory work. Six pages devoted to specifications for use of "Gunite" in all job classifications listed above.

NEW! BETTER!

Cabl-ox

THE NEW WIRE ROPE CLAMP That Really Holds the Line!



CABL-OX clamps work on a brand new wedging principle. Holding power increases with the load and exceeds tensile strength of rope used. Does not crush and weaken rope like old style U-clips. Assembly is fast, neat . . . saves breakdowns, equipment, injuries and expense. Can be used over and over. Cadmium plated.

Cabl-ox

- **Made in all sizes from 1/16" to 3/4". For all wire rope applications.**
- ***Ask your distributor or write for illustrated folder and prices.***

NUNN MFG. CO.
2125 Dewey Avenue
Evanston, Illinois

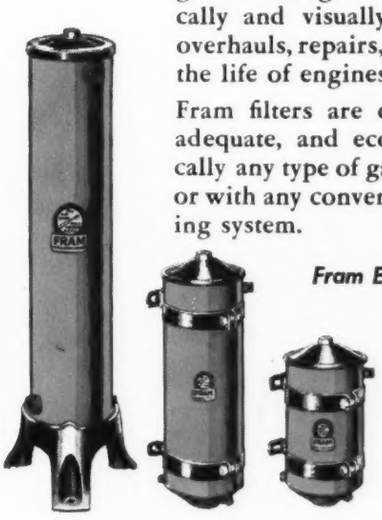
How FRAM Oil Filters Save You Money

Dirt, dust, grit and abrasives, ever present on most construction jobs, can wear away the moving parts of any engine to cause overhauls, breakdowns and repairs. At the same time, sticky sludge, a constant enemy of internal combustion engines, can literally "gum up the works" to increase wear, decrease efficiency. But with a heavy-duty Fram oil filter, dirt, dust, grit and sludge are filtered out to keep oil physically and visually* clean. Thus, Fram saves overhauls, repairs, and costly delays—lengthens the life of engines!

Fram filters are engineered for the efficient, adequate, and economical filtering of practically any type of gasoline, gas or Diesel engine, or with any conventional type pressure lubricating system.

Remember, every Fram filter is backed by the following iron-clad guarantee: If—within 90 days of purchase—you feel you can operate your equipment without Fram filters, bring them back and your money will be cheerfully refunded. With Fram you've everything to gain—nothing to lose! Moreover, if your equipment already has filters, you can put in genuine Fram replacement cartridges to step up performance. There's a Fram cartridge made to fit 'most every type of filter. For information on Fram filters, write: Fram Corporation, Providence 16, R. I. *In Canada:* J. C. Adams Co., Ltd., Toronto.

** Certain heavy-duty oils, due to the type of detergent additive used, will turn dark in color almost as soon as put into the motor. Where such oils are used, filter cartridges must be changed on a mileage or hourly basis.*



Fram Engineering Service and Laboratory are available to assist in determining the proper installation for both lube and fuel oil filters.

FRAM Oil & Motor Cleaner

The Modern Oil Filter

HELPS
SPEED UP
WORK-PROGRESS
ON RUSH JOBS!

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: Magnolia Petroleum Company, General Petroleum Corporation of California

Contractors! Learn how Complete Lubrication Service helps you beat time estimates on Jobs!

Question: **Are machine breakdowns disrupting tight work schedules . . . slowing work output?**

Answer: Call in Socony-Vacuum! We'll help you avoid equipment failures—speed operations—boost output—with exactly the *right* oil or grease for every part of every machine at work! Whatever your needs, you can now fill them from a *single* convenient source.

Question: **Looking for a way to cut down maintenance time *without* impairing machine efficiency?**

Answer: Rely on Socony-Vacuum! Our Representative supplies you with latest job-tested maintenance schedules—helps your men adapt them to your individual needs. He can also instruct "green" help on *where, when and how* to lubricate all your machines.

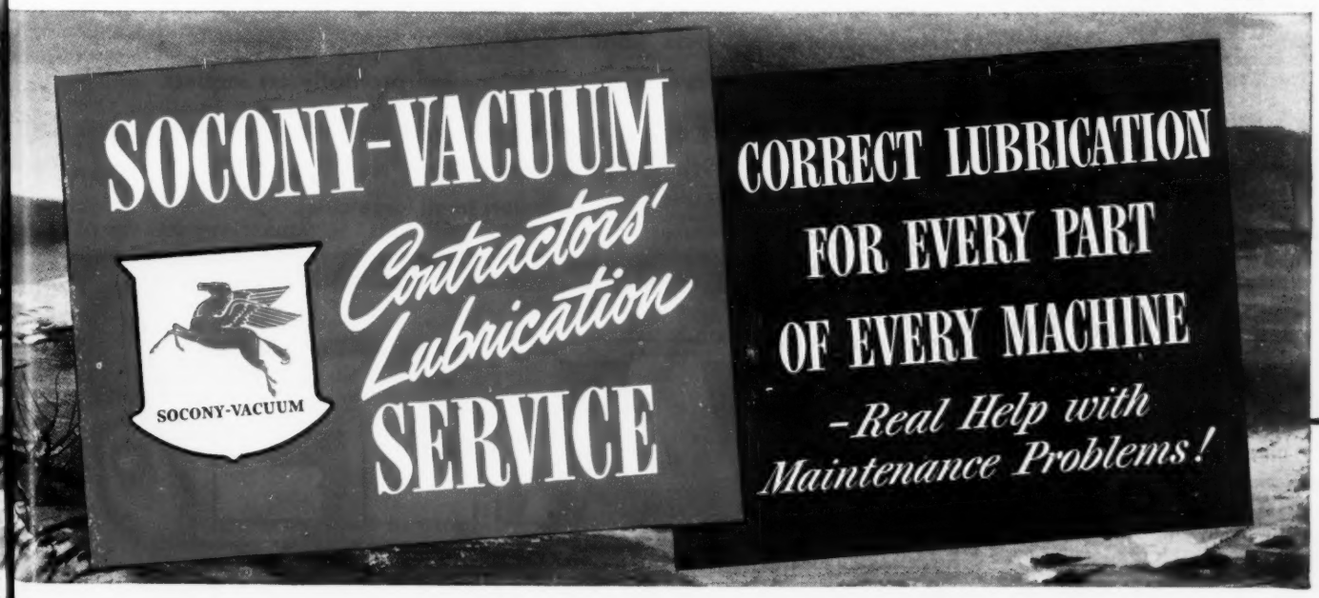
Question: **Are you refueling and lubricating equipment the hard way—losing valuable time out on the job?**

Answer: Rely on Socony-Vacuum! Our on-the-job delivery service minimizes field interruptions, reduces inventory problems, saves office time. No more bother with special orders, follow-ups, extra bookkeeping.

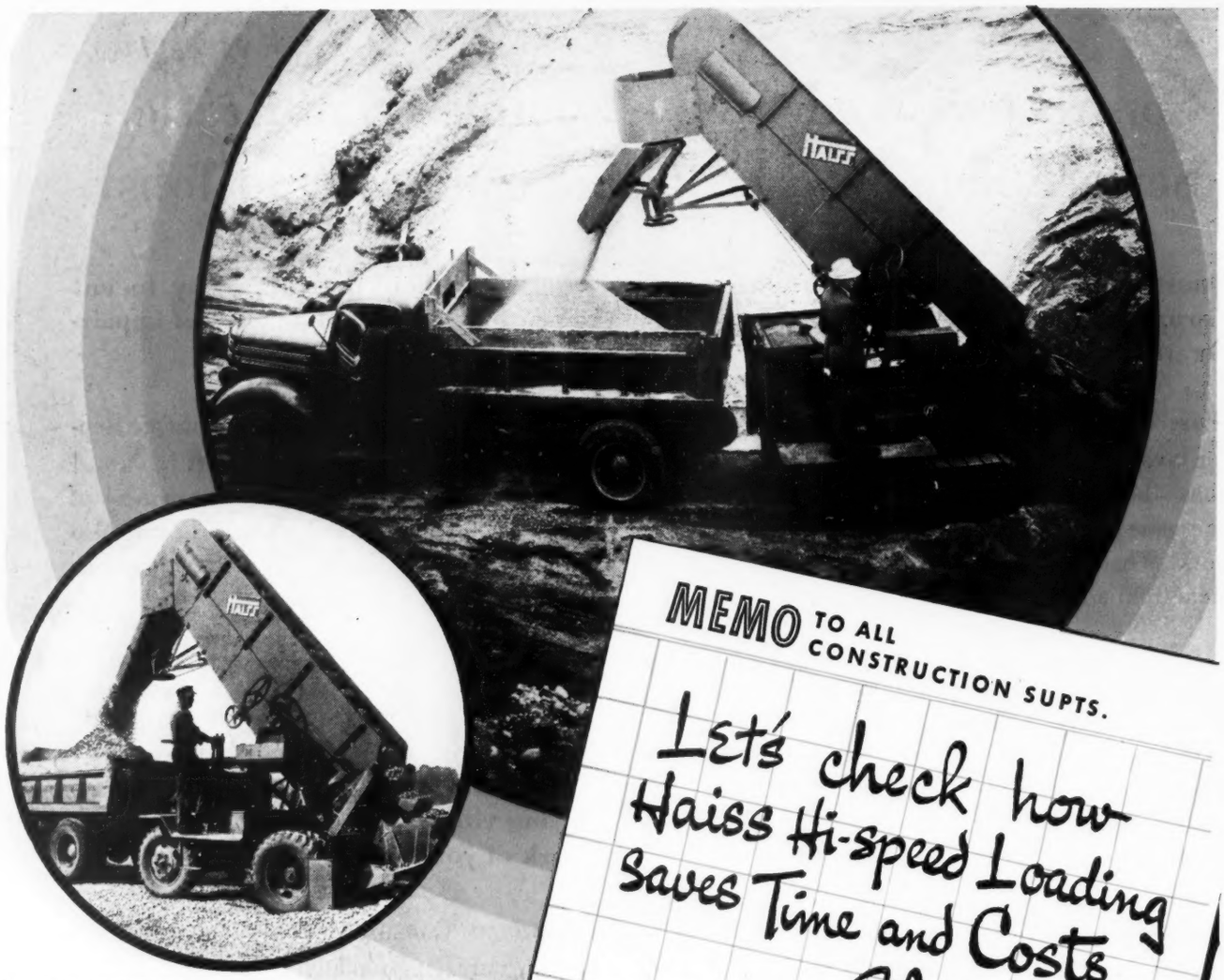
Question: **Is "problem" equipment delaying vital operations . . . stopping the work of your entire plant?**

Answer: Consult Socony-Vacuum! Here again, our Representative can save you time—give your men practical help—call in special lubrication engineers when necessary.

Why Be Satisfied Merely With "Gas and Oil" When You Can Get Complete Service!



Tune in "Information Please"—Monday Evenings, 9.30 E. S. T.—NBC



MEMO TO ALL CONSTRUCTION SUPTS.

Let's check how Haiss Hi-speed Loading saves Time and Costs.

EJK—

SIMPLE CONVERSION MOUNTINGS Haiss simplified design of the Model 75 provides for quick interchange of creepers and wheels in the field. Standard parts. No shop work required.

When loading is tough and you can't keep trucks moving fast enough for profit, put your money on a Haiss. It's the Loader that's built to crowd a stock pile or bank and move it up to 8 yd.-a-minute speed . . . the Loader that's engineered to dig *anything* a man can shovel and do its own clean-up scraping. Haiss Loaders cost more, because they're worth more. They're worth more, because they're superbly engineered for greater mechanical reliability, greater overall operating economy. Investigate now how Haiss Hi-Speed Loading can save time and lower cost of your materials handling. Catalogs containing complete information will be mailed promptly on request.

GEORGE HAISS MFG. CO., INC.
139th Street & Canal Place, New York 51, N. Y.
Distributors in all large cities.

HAISS

PORTABLE CONVEYORS ★ LOADERS ★ CLAMSHELL BUCKETS

NEWS OF
EQUIPMENT MEN

Gwilym A. Price has been elected president of the Westinghouse Electric Corp., Pittsburgh, succeeding **George H. Bucher,** who was named vice chairman of the board of directors. Elected a vice-president in 1943, Mr. Price has served as executive vice-president since last May.

Newly elected president of the Masonite Corp., Chicago, is **Eugene Holland,** former president of the Florence Stove Co. He succeeds **M. P. McCullough,** president pro tem, who will continue as a member of the company's board of directors and chairman of the executive committee.

Reorganization of the sales organization of The Goodyear Tire & Rubber Co., raises **R. W. Fitzgerald** to the post of Western division manager, with headquarters in Los Angeles. Succeeding him as manager of the Detroit district is **M. C. McAlonan,** whose place as Oklahoma district manager will be taken by **R. G. Miller. L. L. Passmore,** Chicago district store supervisor, replaces Mr. Miller as Peoria district manager.

Released from active duty as captain in the Army Air Forces, **W. McKean White, Jr.,** has returned to his prewar position as vice-president of the White Manufacturing Co., Elkhart, Ind.

New vice-presidents of the Bemis Bro. Bag Co., St. Louis, Mo., elected at the annual board of directors' meeting are: **H. V. Howes,** director of sales; **H. P. Claussen,** director of cotton department at Boston; and **Judson Bemis,** manager of Minneapolis plant. **T. W. Little,** an executive in the burlap importing department at Boston, was named treasurer.

Returned to his former post as export manager of the Osgood Co. and the General Excavator Co., of Marion, Ohio, is **Lieut. Robert Maynard,** who was discharged from the Navy after serving three years.

"We're using KOTAL Mixes All Year 'Round!"

There's a world of difference between ordinary cold mixes and KOTAL Cold Mixes! KOTAL Master Mixes are tougher; more stable; resist stripping; handle easier and last longer.

KOTAL Master Mixes are known as the "all-seasons pavement." They lay equally as well in cold, wet weather as in hot, dry, summer weather. KOTAL Master Mixes can be "stock-piled." Whether your plant is running or not, KOTAL Master Mixes will be available for the needs of your customers.

Keep your crews busy—Spring—Summer—Fall—Winter—by using KOTAL Master Mixes.

IT'S THE KOTAL PROCESS THAT MAKES THE DIFFERENCE

Eight Working Features of KOTAL Master Mixes

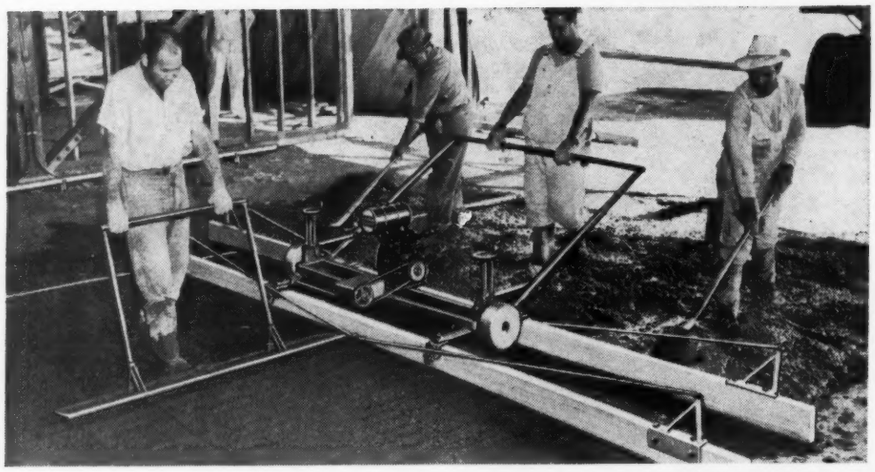
EASY TO USE. Quickly mixed, ready to lay. No preheating or drying.
STABILITY. Cure quickly and permanently. Do not shift, ravel or pick up. Open sooner to traffic.
WORKABILITY. Do not adhere to equipment. Work easily.
LONG-TERM STOCK PILES. Can be stock-piled for many months without losing workability.
SAVE TIME. Quickly made stock piles ready for immediate use without frequent fresh mixes.
SAVE LABOR. Actual road records prove fewer labor hours required.
SAVE MONEY. Savings in time and labor mean economies in road costs.
EXTEND PAVING SEASON. All-weather workability permits more months of operation.

Write for your copy of booklet which tells the story of KOTAL Master Mixes. We will also send you the name of your nearest supplier.

MASTER MIXES KOTAL **KOTAL COMPANY ★ 52 Vanderbilt Ave. ★ New York 17**

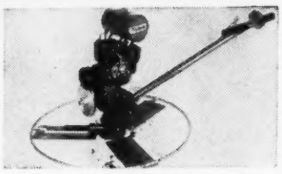
KOTAL *Master Mixes*

The Advanced All-Weather Aid in Building Better Roads



SHORT OF SKILLED "FINISHERS"?

Whiteman Concrete Equipment is the answer . . . for better, compact and level slabs . . . with machine economy. The portable Lightweight Rodding Machine shown above is Model "RS" . . . for slab widths 3 to 12 feet. Also in Model 44 . . . for slabs 10 to 20 feet. HAND GRILL TAMPER, at left, tamps down larger aggregate.



At right: Lightweight Floating—Finishing Machine Model "J".

Write or wire for details.

CONCRETE EQUIPMENT Whiteman MANUFACTURING COMPANY LOS ANGELES CALIF U.S.A.

Whiteman MANUFACTURING COMPANY
3249 Casitas Avenue
Los Angeles 26, California

MASTER COST-SAVING EQUIPMENT—FOR IMMEDIATE DELIVERY

Gas or Electric Concrete Vibrators (Catalog No. 689)

Hand Tools for operating from all Master Vibrators and BIG-3 (Catalog No. 683)

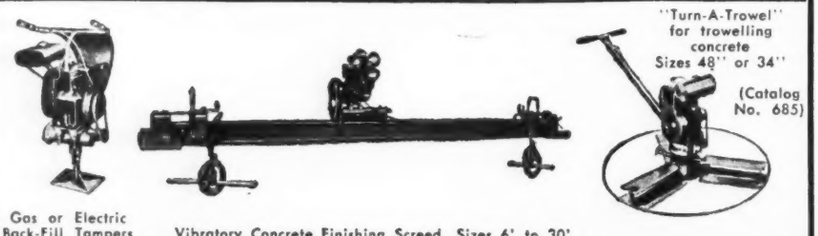
BIG-3 for Generation, Tool Operation and Concrete Vibration (Catalog No. 687)

Portable Gas-Electric Generator Plants. Sizes 500 to 17000 Watts (Catalog No. 594)

General Purpose Floodlights

"Power-Blow" Electric Hammer and Spade (Catalog No. 688)

Electric Pavement Breaker (Cat. No. 718)



"Turn-A-Trowel" for trowelling concrete Sizes 48" or 34" (Catalog No. 685)

Gas or Electric Back-Fill Tampers (Catalog No. 699)

Vibratory Concrete Finishing Screed, Sizes 6' to 30' (Catalog No. 596)

Send for illustrated catalog on any item to
MASTER VIBRATOR COMPANY
DAYTON 1, OHIO

Appointment of **Ralph N. Weber** as service manager is announced by the Le Roi Co., Milwaukee, Wis. He has been associated with company for 10 years, serving in the Catalog, Purchasing and Accounting Departments and as manager of the Service Order Department.

The Heil Co., Milwaukee, Wis., has named **Dan C. Pierce** (center) as sales manager and **Robert L. Miller** (left) assistant sales manager of its Road

Machinery Division. **Len C. Anderson** (right) is new manager of District Sales. **Ted Miller** (not pictured) will take over as sales promotion manager for all divisions of the company.

Domestic sales organization of 57 exclusive distributors in the United States and Canada has been announced by **G. S. McKenty,** general sales manager for R. G. LeTourneau, Inc., of Peoria, Ill. This newly formed sales structure is the consummation of a sign-up program inaugurated in 1944.

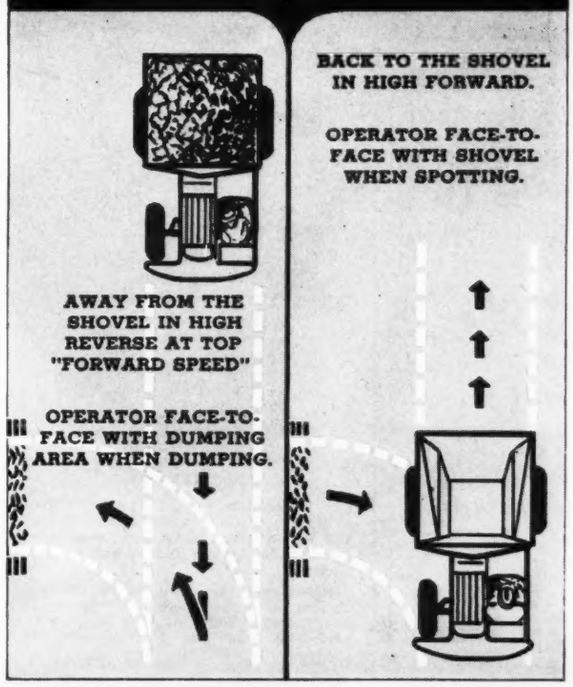
Harry F. Van Wagner has been appointed assistant sales manager of the Glens Falls Portland Cement Co., Glens Falls, N. Y. He was formerly assistant sales manager for the Universal Atlas Cement Co. and is a member of The Moles, New York organization of tunnel and heavy construction men.

Returned from three years' service with the U. S. Coast Guard, **Marvin F. Thoroughgood** has been named West Coast regional representative to handle sales and service for The Timken Detroit Axle Co. Detroit. Before the war he was Pacific Coast general manager of the Columbia Axle Co., Cleveland.

Paul Fenwick has been appointed district manager in California, Arizona and Nevada for Lima Locomotive Works, Inc., Shovel & Crane Division, Lima, Ohio. He was recently released from Army Transportation Corps with the rank of lieutenant colonel.

FORWARD SPEEDS IN REVERSE
ELIMINATE SLOW TURNS IN THE TIGHT SPOTS

HOW DUMPTOR "*SHUTTLE*" RUNS SAVE MONEY ON TURNS . . .


BACK TO THE SHOVEL IN HIGH FORWARD.
OPERATOR FACE-TO-FACE WITH SHOVEL WHEN SPOTTING.
AWAY FROM THE SHOVEL IN HIGH REVERSE AT TOP "FORWARD SPEED"
OPERATOR FACE-TO-FACE WITH DUMPING AREA WHEN DUMPING.

Reverse isn't s-l-o-w with the Dumptor. Three reverse speeds are fast, just as fast as the three forward speeds. Saves time on short "shuttle" runs. High Reverse away from the shovel to grizzly or tipple. Then back to the shovel in High Forward. Two slow turns eliminated. (See diagram). On longer runs, fast reverse means faster backouts, faster turns. Check time for turns on your hauling job, then figure your gains with Dumptors on the job.

KOEHRING COMPANY *Milwaukee 10, Wis.*

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

"SUBWAY"

ALL-SYNPLASTIC AIR HOSE

"SUBWAY" is made not only for the roughest, toughest jobs, but to stay *on* those jobs *longer!* Tube, carcass and cover are combined in a strong, punishment-resisting construction that has made this hose a favorite among contractors for many years, for all types of pneumatic tools. Sizes ½" to 1¼", inclusive. Specify "SUBWAY", Style D-142.

OTHER GOODALL PRODUCTS FOR CONTRACTORS

Steam, Water, Suction, Concrete Placing and Hydraulic Hose. Conveyor and Transmission Belting. Water-proof Boots and Clothing. Backed by 76 years of manufacturing experience, and "Engineered to Your Job."

Contact Our Nearest Branch or Main Office for Details and Prices.

GOODALL RUBBER COMPANY • INCORPORATED

THE GOODALL-WHITEHEAD COMPANIES

Philadelphia • Trenton • New York • Chicago • Pittsburgh • Boston
Los Angeles • San Francisco • Seattle • Salt Lake City • Houston

WE ARE PARTICIPANTS IN THE OWNERSHIP AND OPERATION OF NATIONAL SYNTHETIC RUBBER CORPORATION

Factory—Trenton, N. J. Established 1870

Assigned as sales engineer for the Construction Equipment Division, Worthington Pump & Machinery Corp., Newark, N. J., is **Paul La France.** His headquarters will be in Washington, D. C. During the war he served as a lieutenant commander with the Seabees.

A. T. Marchuk, who joined **the A**they Products Co. in 1936, has been promoted to production manager.

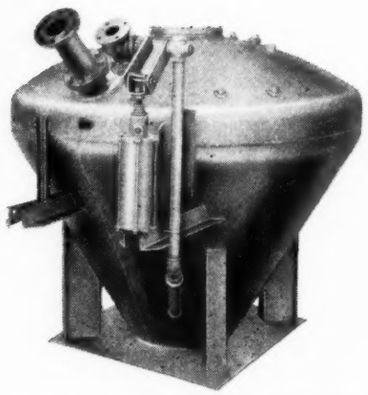
Tractor Scrapers

(Continued from page 97)

work be done on U.S. 75 in 1945. In order to push the job through to completion before cold weather, Megarry Bros. agreed to have permanent surface graveling of U.S. 75 in place ready for traffic before winter or to put on uncompleted portions at their own expense 1,200

(Continued on page 150)

Move Cement by Air-Floating It!



The ROBINSON AIR-ACTIVATED CONVEYOR SYSTEM is practical and efficient, saving in air and maintenance. It has been used on numerous big construction jobs as well as in process plants.

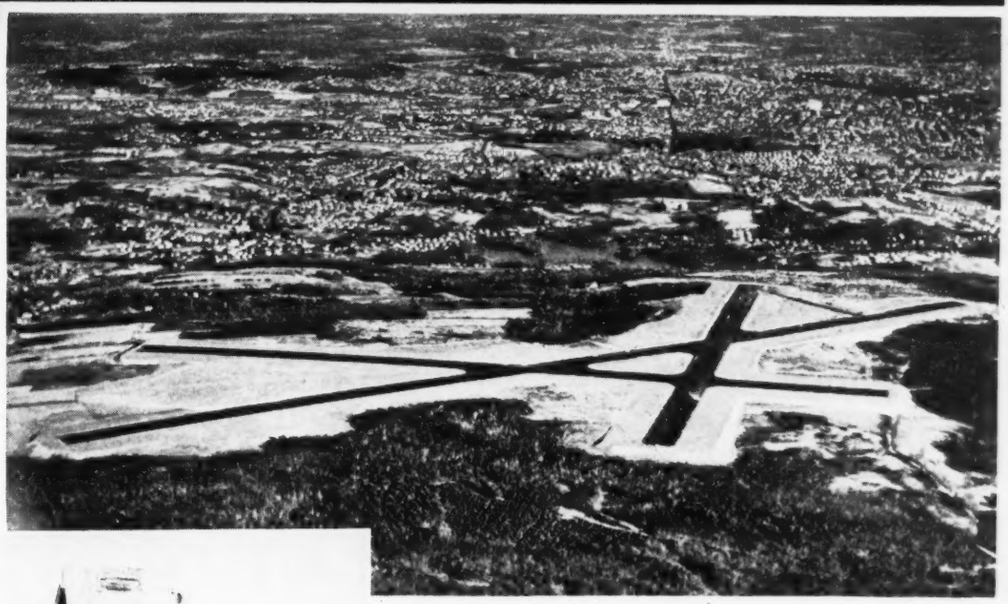
You can order the entire system installed including compressor, piping, storage tanks, etc. or just the activator, such as illustrated, to be used with your own accessory equipment.

Write for illustrated Bulletin No. 310

ROBINSON AIR-ACTIVATED CONVEYOR SYSTEMS

Division of MORSE BOULGER DESTRUCTOR CO.
211-C EAST 42nd STREET, NEW YORK 17, N.Y.
Representatives in all Principal Cities

New Worcester Municipal Airport has shock-absorbing Texaco runways



Heavy-duty Texaco Asphaltic Concerte paving, 4 inches thick and 150 feet wide, serves the three runways of Worcester's modern municipal airport.

Laying Texaco Asphaltic Concrete wearing surface on Worcester airport runways.

Crowd greets the first plane to land at the new Worcester Municipal Airport.

Worcester, Mass., again demonstrates why it is recognized as one of New England's most progressive cities. Long aware of the boom in air transportation which would follow the war, Worcester carefully prepared its plans, which have now materialized in the city's modern new airport.

The three runways of Worcester's airport range from 3,750 to 5,500 feet in length. They are supported by a gravel base 14 inches thick, on which is laid 4 inches of bituminous penetration macadam. The wearing surface consists of a 4-inch thickness of resilient, heavy-duty Texaco Asphaltic Concrete paving, laid in two courses.

That Worcester's Texaco Asphalt runways are more than adequate for the heaviest peacetime air traffic has been proved conclusively by millions of square yards of Texaco-paved runways on U.S. Army and Navy flying fields.

Texaco Engineers, who are Asphalt specialists, will be glad to discuss your airport paving problem with you. Write our nearest office.

TEXACO

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2 Richmond 19

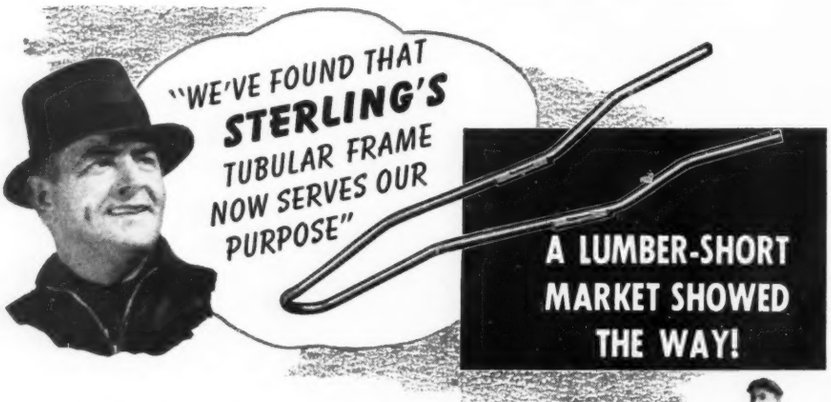
TEXACO ASPHALT

puts the weight . . .
where it's needed!

3-AXLE TANDEMS
9 to 17 tons
•
TANDEM ROLLERS
3 to 14 tons
•
3-WHEEL ROLLERS
6 to 12 tons
•
TRENCH ROLLERS

SURFACE irregularities vanish under the 3-axle tandem. As any one roll contacts a high spot, it automatically "borrows" additional weight for greater compaction. This, together with exclusive Buffalo-Springfield *synchronized steering* of the two guide rolls makes possible smoothness of rolling not possible with any other equipment. Ask your distributor for details.

BUFFALO-SPRINGFIELD
The Buffalo-Springfield Roller Co.
Springfield, Ohio



Continuous steel tubing — more readily available than wood under today's conditions — has been a vital factor in STERLING'S reputation for quality and performance. The TUBULAR FRAME, reinforced to give additional strength at points where stress and strain are greatest, fortifies your STERLING Wheelbarrow for tough use and hard punishment under every condition. So, be sure to specify the STERLING tubular framed barrows on your next order.

Note: Deliveries of Sterling Wheelbarrows are being stepped up as rapidly as improvement in the raw material situation permits.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

(Continued from page 148)

cu.yd. of gravel per mi. to carry winter traffic. Because of the speed of construction, the contractors were able to place the permanent gravel.

Contractors' Plant

Ten Caterpillar tractors, seven D8's and three D7's, and ten Le Tourneau scrapers made up the earthmoving fleet. The scrapers were five 23-yd., one 14-yd., two 12-yd. and two 8-yd. Two D8 pusher tractors were used to assist loading and to help loaded units out of deep ditch excavation. A D7 tractor-bulldozer served varied purposes.

Highway embankment was placed in 12-in. lifts up to the last foot, which was put on in 6-in. layers. Each lift was compacted by sheepsfoot rollers. The contractors operated two LaPlant-Choate three-section sheepsfoot rollers, drawn by a D7 and an RD7 tractor. A spring-tooth harrow was pulled by an International TD-6 tractor. Four Caterpillar auto patrols, three No. 12 and one No. 11, shaped the grade. One Bucyrus-Erie 10B ½-yd. dragline was used for general excavation, and another handled the salvaged bituminous mat at the crushing and screening setup. At a gravel pit, the contractors had an RD7 bulldozer and a conveyor and screens. For the final part of the drainage contract, a larger dragline was to be brought in to dig the lateral ditches.

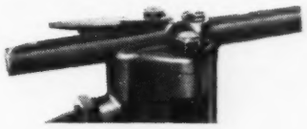
Principal illumination for night work was furnished by three floodlight towers, one equipped with a Nighthawk 4,000-w. plant and two with Kohler 1,500-w. plants. The job welding truck also carried a 1,-500-w. Kohler light plant.

Direction

Plans for the highway work included plans for the adjacent drainage ditch, designated Judicial Ditch No. 11, and the combination project was constructed under the direction of the Minnesota State Highway Department. M. J. Hoffman is commissioner of highways, and O. L. Kipp is assistant commissioner and chief engineer. The construction engineer for the highway department is C. L. Methven. On the job, H. W. Perkins, resident engineer, was in charge of the work. For Megarry Bros., contractors, St. Cloud, Minn., Jack Rucker, superintendent directed all operations.

ANNOUNCING...

a new Gardner-Denver postwar breaker with the NEW SAFETY LATCH



It's a *postwar* Paving Breaker, in every sense of the word—this new Gardner-Denver Model B87! Thanks to the new Gardner-Denver safety latch—an exclusive feature—this breaker can be moved from place to place or from level to level on the job without shutting off the air—and without danger of injury to the operator. The throttle cannot open accidentally because the safety latch holds it securely against accidental openings. Quickly engaged or disengaged by a flip of the operator's thumb, the new latch works like the "safety" on the trigger of a gun—prevents accidents before they happen. Other new features of the B87 are—

SHORT WHERE IT COUNTS—*The B87 is shorter from top of gad to holding handles. It's easier to operate with standard length chisels and gads—more comfortable to operator when longer points are necessary.*

NO AIR OR OIL LEAKAGE—*Joints on the B87 breaker are not under air pressure—no wasteful nor annoying leakage of air or oil.*

FIVE-HOUR LUBRICATION—*Built-in lubricator holds enough oil for five hours of normal operation. Lubrication is positive to every working part, including gads.*

COOL HANDLES—*Heated air cannot cause discomfort to operator because air inlet is at side of cylinder and not through backhead.*

RENEWABLE CHUCK LINER—*No need to replace the entire chuck end when chuck wears to a loose fit of the gad shank. Renewable liner makes this repair quick and easy.*

TOOL RETAINER—*Extra heavy forged retainer pivots on substantial pin held positively in place. No nut to become loose.*

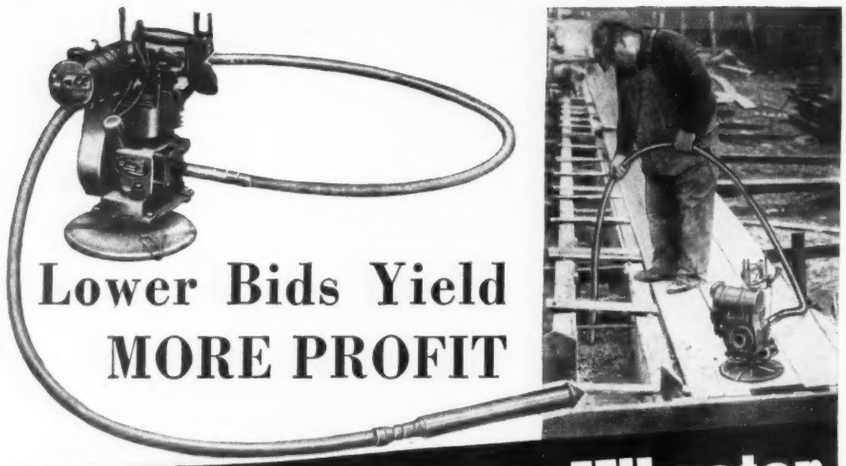
CONVERTIBLE TO SHEETING DRIVER—*The B87 is convertible to a sheeting driver by removing the standard chuck end and substituting a jaw-type sheeting driver head. Jaw assemblies adjustable to take up to 3-inch sheeting are available.*

Gardner-Denver Company, Quincy, Illinois

GARDNER-DENVER

Since 1859

USE COMPRESSED AIR FOR SAFETY CONVENIENCE FLEXIBILITY



Lower Bids Yield MORE PROFIT

WITH A Mall REG. U.S. PAT. OFF. Concrete Vibrator

For increased speed, economy and efficiency, use a Mall Concrete Vibrator at every stage of construction. It places a stiff mix concrete that assures a stronger, watertight job—greater strength and density—better bond with reinforcements—and earlier stripping of forms. It can be carried or wheeled anywhere on the job. Attachments easily interchangeable with the vibrating element make it readily adaptable to Wet Wall Rubbing, Wire Brushing, Grinding, Sanding and Drilling.

1½ H. P. Gasoline Powered model available, also 3 H. P. round base or wheel barrow mounting, 1½ H. P. Universal Electric and 7500 r. p. m. Pneumatic Units.

Ask your distributor for Mall Concrete Vibrators or write for literature and prices.

MALL TOOL COMPANY, 7757 South Chicago Ave., Chicago 19, Ill.

★ 25 Years of "Better Tools for Better Work."

Mall REG. U.S. PAT. OFF. PORTABLE POWER TOOLS

THE OWEN BUCKET CO.

6020 Breakwater Avenue Cleveland, Ohio

Branches: New York, Chicago, Philadelphia, Berkeley, Cal.

Jeeps

(Continued from page 104)

field with a 1,200-lb. load. Other differences include a new combustion chamber which increases power; a radiator shroud for more effective cooling; a larger clutch for increased loads; redesigned steering linkage for ease in handling and free rolling; greater rigidity of chassis frame; rear shock absorbers mounted at an angle to keep the floor level; and a gear shift lever placed on steering column for

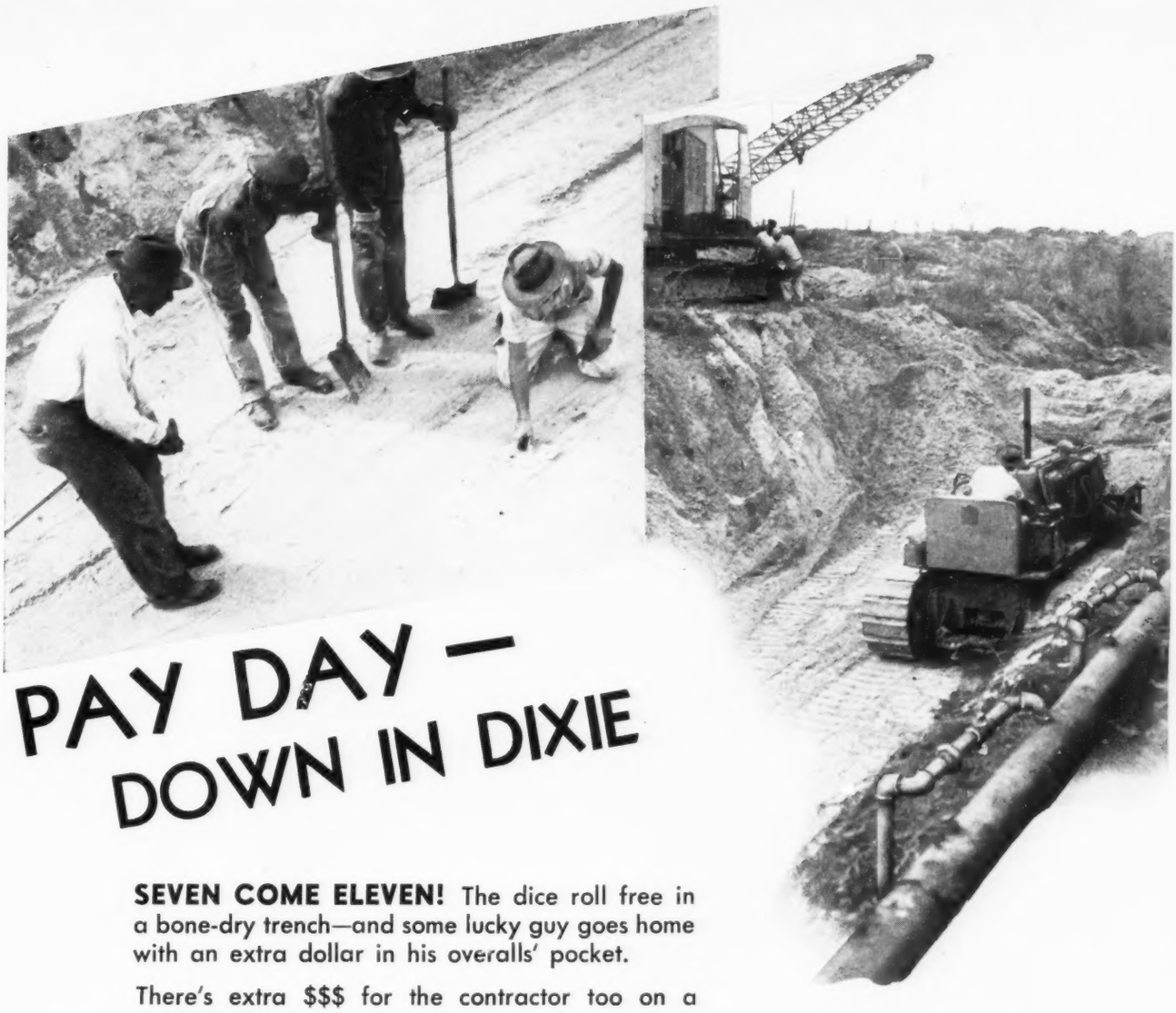
ARMY ENGINEERS fitted Jeep with rear racks for carrying gas tanks for field welding service.

greater convenience. The 4-wheel drive has been restrained.

Special accessories such as snow plow and grader attachments, spray painting equipment and a capstan winch, are also available. Mounted on the frame between bumper and radiator, the winch is driven through a propeller shaft and two universal joints from the front end of the engine crankshaft. The unit is designed for 5,000-lb. pull, using either ¾-in. or 1-in. manila rope.

Those who saw the Jeep in action overseas, especially in Seabee and Army Engineer units, can visualize a multitude of uses for this revamped vehicle on construction work. It would be handy as transportation for supervisors or as a light pick-up, especially when fitted with side racks for carrying pipe, reinforcing and lumber. It has possibilities as a portable electric welder, power saw, air compressor, small crane, auger, generating plant, or hoist, either with power take-off drive or independent power supply. As a hauling unit it could pull small plows and rippers, and snake cars, logs, timbers and heavy pipe around

(Continued on page 154)



PAY DAY — DOWN IN DIXIE

SEVEN COME ELEVEN! The dice roll free in a bone-dry trench—and some lucky guy goes home with an extra dollar in his overalls' pocket.

There's extra $$$ for the contractor too on a MORETRENCH job. Dry digging is fast—easy to handle—economical. Expensive sheeting and bracing are frequently eliminated. Time and money saved at every turn.

These are facts—not fancies. Proof lies in the great volume of repeat orders that make up our business. For example, *the above sewer trench is the* ***7th*** *project in the past four years dewatered by Moretrench for Boh Bros. Const. Co. of New Orleans.*

Whenever you tackle a wet job, the dice are loaded against you. A MORETRENCH WELLPOINT SYSTEM can change that. Write, wire or phone us. Large or small, your job will receive our immediate attention.

CATALOG ON REQUEST

●

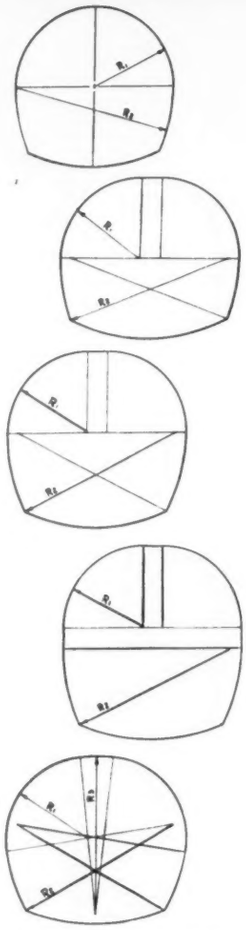
MORETRENCH CORPORATION

90 WEST STREET, NEW YORK 6

ROCKAWAY, NEW JERSEY

CHICAGO 23, ILL. • HOUSTON 8, TEX. • TAMPA 6, FLA.

WHERE CROSS-SECTIONS CHANGE FROM STATION TO STATION



Coordinating forming methods with the concrete design may effect large savings in the construction of tunnels, conduits, walls and other concrete structures.

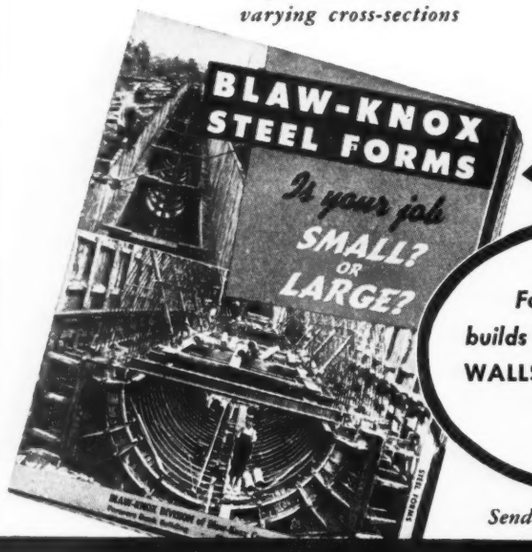
If the job requires 20 to 30 repetitions of similar unit pours, it is generally conceded that steel forms should be specified.

Blaw-Knox Steel Forms are designed for easy adjustment to varying sizes of cross-sections. Advantage can still be taken of their economies and time-saving features even when the cross-sections change from station to station.

In simple diagrams and quickly read explanations the Blaw-Knox Steel Form Bulletin tells how, when, and where to specify steel forms.

BLAW-KNOX DIVISION
of Blaw-Knox Company
2086 FARMERS BANK BLDG.
PITTSBURGH, PA.

Adjustment methods for varying cross-sections



For the man who builds **TUNNELS, SEWERS, WALLS** *and other concrete structures*

Send for Bulletin No. 2035

BLAW-KNOX STEEL FORMS

(Continued from page 152)

the job, or mount a small bulldozer. In fact, if a contractor turned an imaginative returned veteran loose with a Jeep on a construction job he probably will be amazed at the possible applications.

The Willys-Overland production schedule calls for a total of approximately 90,000 Jeeps by the end of 1946.

Wellpoints

(Continued from page 103)

concrete 30 in. thick was to be placed to carry concrete footings for the piers.

The contractor wisely elected to use the Moretrench wellpoint system of dewatering material to be excavated. Heavy drift, consisting of trees, logs and miscellaneous debris, had lodged against the collapsed truss so that it was question-

Watch

MC

For the Latest in

Pumps . . . Mixers . . .
Concrete Guns . . .
Batching and Placing
Equipment . . . Hoists
. . . Power Saws . . .
Electric Generator
Sets . . . Carts . . .

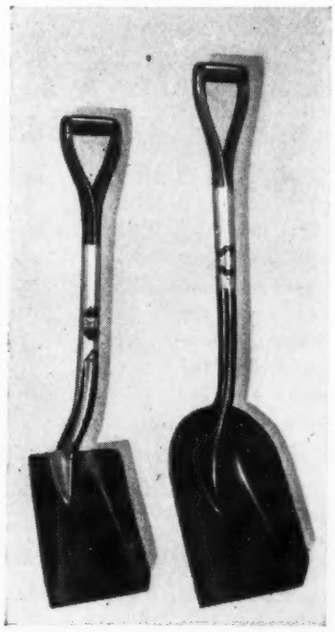
CONSTRUCTION MACHINERY CO.
Waterloo, Iowa

able whether steel sheeting could have been driven. Drift varying from 10 to 15 ft. was buried in sand at the location of three pier footings.

Wellpoint Equipment

Wellpoint equipment consisted of the following items: an 8-in. and a 6-in. centrifugal pump, each equipped with patented vacuum pumps; a supply of 8-in. header pipe, i.e., the main into which the wellpoints feed via riser pipes; a supply of 2-in. riser pipes; sufficient swing connections, comprising two pairs of swinging elbows separated by a short section of 2-in. pipe equipped with a self-draining valve and a union; wellpoints, consisting of a 3-ft. section of 2-in. perforated pipe covered with a cylindrical screen which admitted water but excluded mud, silt and foreign material, the bottom of the wellpoint pipe being serrated to facilitate lowering or jetting to desired eleva-

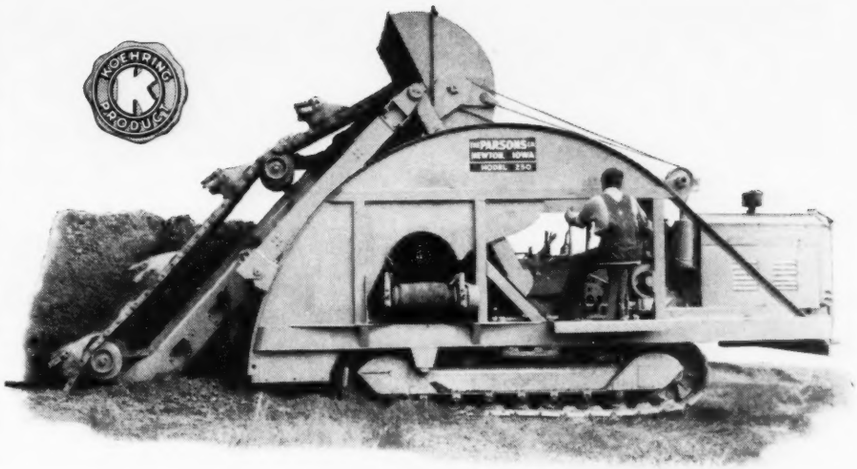
(Continued on page 156)



BLADE EDGES
GUARANTEED SPLIT-PROOF

INGERSOLL SHOVELS
"The Borg-Warner Line"

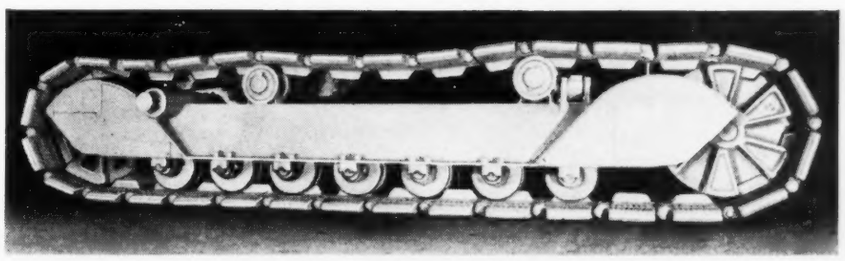
Write for Catalog and Prices
INGERSOLL STEEL DIVISION
BORG-WARNER CORPORATION
New Castle, Indiana
Plants: New Castle, Ind.; Chicago, Ill.; Kalamazoo, Mich.



Shovel Type Shoes

• **Crawler shoes on the Parsons 250 Trenchliner, and on the other Parsons Trenchliners, are the same rugged, long lasting, trouble-free type used on Heavy-Duty power shovels and cranes. Each individual shoe is strong enough to carry the whole weight of the Trenchliner. Self-cleaning because their streamlined shape sheds dirt. Crawler belts are 18″ wide, 9′ long center to center, provide low ground pressure — only 7 lbs. per square inch. That's why this 26,000 lb. Trenchliner keeps its smooth mobility even on soft ground.**

PARSONS 250 TRENCHLINER



WRITE FOR YOUR CATALOG TODAY!

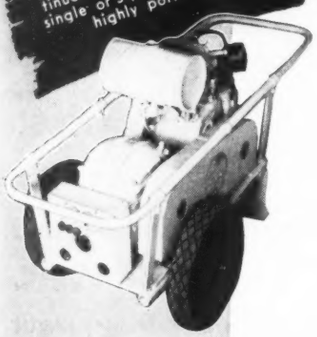
PARSONS COMPANY
KOEHRING SUBSIDIARY **NEWTON, IOWA**

TRENCHING EQUIPMENT PARSONS

Continuous DAY IN *and* DAY OUT *Dependability*

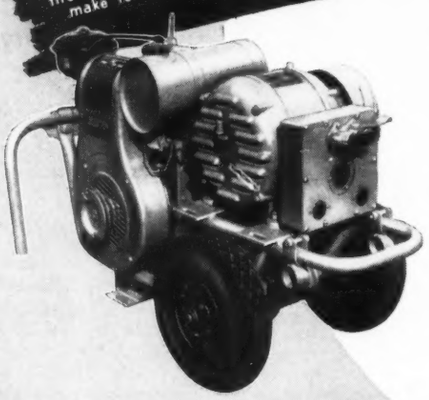
SUCH AS NO PORTABLE POWER PLANTS EVER BEFORE POSSESSED

JACKSON MODEL M-1
Capacity 1.25 K.V.A., continuous duty, 115 Volt, AC single or 3-phase. Compact, highly portable.



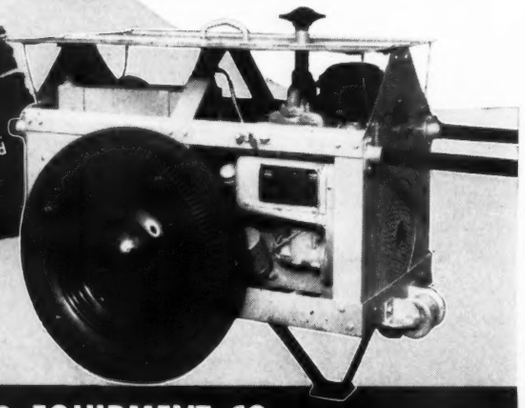
You'll save yourself a wad of dough if the new Portable Power Plant you buy is one of the new JACKSONS. For these plants completely eliminate the time commonly lost when generator troubles arise. A gang held up for 15 minutes while a generator is adjusted or a brush replaced, in the aggregate means hours and dollars lost.

JACKSON MODEL M-2
Capacity 2.5 K.V.A., continuous duty, 115 Volt, AC single or 3-phase. Drop handles, rubber tires and well balanced weight make for easy portability.



Each JACKSON Plant has a new type, permanent magnet generator which requires no adjustment, no maintenance; is practically trouble-proof. And they deliver full rated capacity in single phase as well as 3 phase, 115 Volt, A.C. power. Add to this the fact that they incorporate the most reliable of engines and quality construction throughout and you have DEPENDABILITY such as no other Power Plant has ever possessed — the finest possible source of power for operating Floodlights, a wide range of power tools, concrete vibrators and vibratory screeds. Get the facts. Write NOW!

JACKSON MODEL M-4
Capacity 5 K.V.A., continuous duty, 7.5 K.V.A. intermittent 115 Volt, AC single or 3-phase. 4 telescoping handles, standard auto tires and well balanced weight provide unusual maneuverability for a plant of this size.



ELECTRIC TAMPER & EQUIPMENT CO., Ludington, Mich.

(Continued from page 155)

tion; 8-in. outlet pipe to convey water from the centrifugal pumps; fittings and coupling devices. Other equipment consisted of crane, concrete mixer and miscellaneous tools.

Header pipe was placed practically horizontal in a rectangle surrounding the area to be dewatered. The 8-in. pump was connected to the header pipe and an outlet pipe was installed. Riser pipes, with Moretrench wellpoints attached to lower ends, were jetted to position. A few of them were located on or in the clay stratum but the majority were lowered approximately 2 ft. below footing elevation. The 6-in. auxiliary pump supplied jet water while the riser pipes with wellpoints attached served as their own jets. The circuit was completed by connecting riser pipes to inlet plugs, spaced 3 ft. apart in the header pipe, by swing connectors.

An area embracing locations of footings for bents 2 and 3 of the bridge was included in the first installation. Pumping was started about 10 a.m. and the following morning a crane with clamshell bucket began removing dry excava-

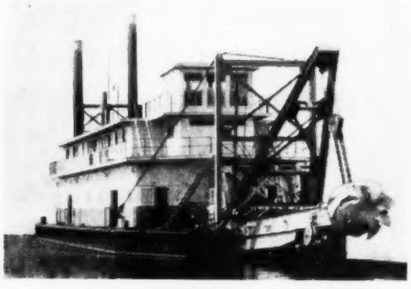
(Continued on page 158)

ELLICOTT DREDGES

For sixty years, Ellicott dredges have been the standard. The NEW Ellicott catalog will be ready soon. It illustrates hydraulic pipe-line dredges, seagoing dredges, bucket-chain dredges, clam shell dredges and many special types.

SEND FOR YOUR COPY TODAY

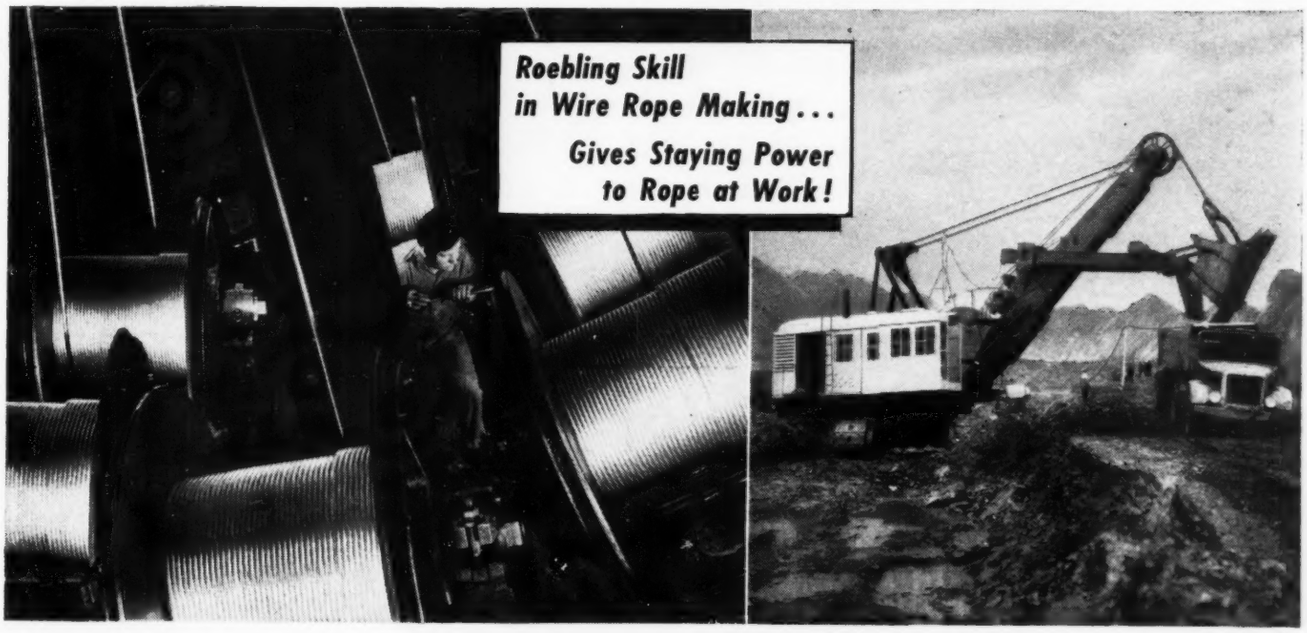
ELLICOTT MACHINE CORPORATION
Baltimore 30, Maryland, U. S. A.



O.M.C. says:

(OLD MAN COMPETITION)

Keep production up—costs down—use the right wire rope!



SUCCESSFUL BUSINESS OPERATION in the face of growing competition will force utmost economy from all industrial equipment and supplies. Production costs must be kept to a minimum.

Roebling wire rope can help do this job. It is economical because of its low average cost, its toughness, its reserve strength under *all* conditions of operation. It helps *save* while it *serves!*

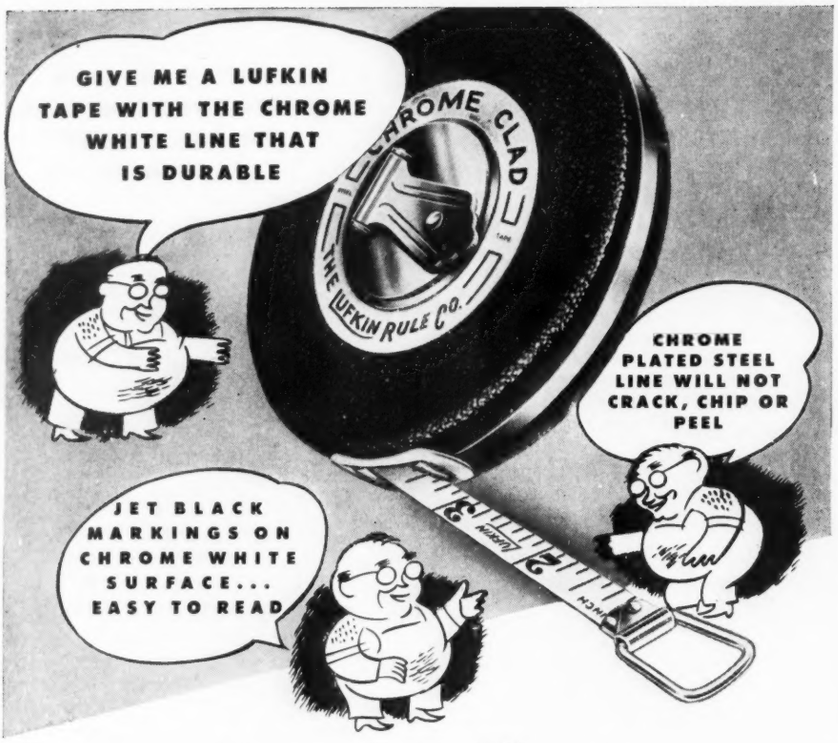
The modern facilities and craftsmanship of America's first wire rope maker are unsurpassed. Constant research and practical engineering back every phase of Roebling operation. Vital factors like these make Roebling "Blue Center" Steel Wire Rope the choice to help you produce in volume . . . keep costs down . . . meet competition profitably.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

WIRE ROPE AND STRAND • FITTINGS • SLINGS • SUSPENSION BRIDGES AND CABLES
COLD ROLLED STRIP • HIGH AND LOW CARBON ACID AND BASIC OPEN HEARTH STEELS
AIRCORD, SWAGED TERMINALS AND ASSEMBLIES • AERIAL WIRE ROPE SYSTEMS • ROUND
AND SHAPED WIRE • ELECTRICAL WIRES AND CABLES • WIRE CLOTH AND NETTING

ROEBLING

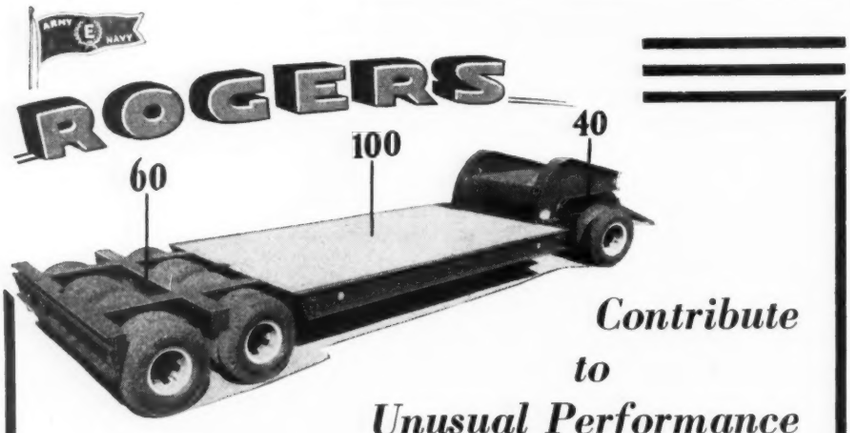
PACEMAKER IN WIRE PRODUCTS


GIVE ME A LUFKIN TAPE WITH THE CHROME WHITE LINE THAT IS DURABLE
CHROME CLAD
THE LUFKIN RULE CO.
CHROME PLATED STEEL LINE WILL NOT CRACK, CHIP OR PEEL
JET BLACK MARKINGS ON CHROME WHITE SURFACE... EASY TO READ

For an accurate, dependable, durable steel tape, the answer is "Lufkin Chrome Clad." Also available with hook-ring for one-man measuring. Sell Lufkin Chrome Clad Steel Tapes.

LUFKIN

THE LUFKIN RULE COMPANY, SAGINAW, MICHIGAN, New York City



Contribute to Unusual Performance

ROGERS TRAILERS are so designed as to carry 60% of the load on the rear unit and 40% on the tractor.

This provides the necessary traction—distributes the load properly over all tires—and greatly improves the haulability and brakeability of both tractor and trailer.

ROGERS BROTHERS CORP. ALBION, PENNA

EXPERIENCE *builds 'em* PERFORMANCE *sells 'em*

(Continued from page 156)

tion to footing elevation which was approximately 12-ft. below streambed. Pumping speed and equipment requirements were held to a minimum by diversion of stream flow from the area being dewatered.

Sides of the excavation stood without cave-in on slopes of 1 on 1, as illustrated. Men engaged in guiding piling and operating jets at the bottom of the footing excavation were on dry ground, except for slight accumulation of water from jetting operations. Placement of concrete footings and piers (forms were prefabricated) followed pile-driving.

Patented pipe coupling devices hastened transfer and installation of Moretrench equipment. Pipe and fittings had plain ends, were butted together, the joint inclosed by a rubber sleeve which was covered by a steel band and tightened with a small wrench. Transfer from one footing to another was accomplished in less than 8 hr.

Work began Aug. 13 and erection of super-structure steel was started Nov. 28.

Aluminum-Treated Concrete

(Continued from page 95)

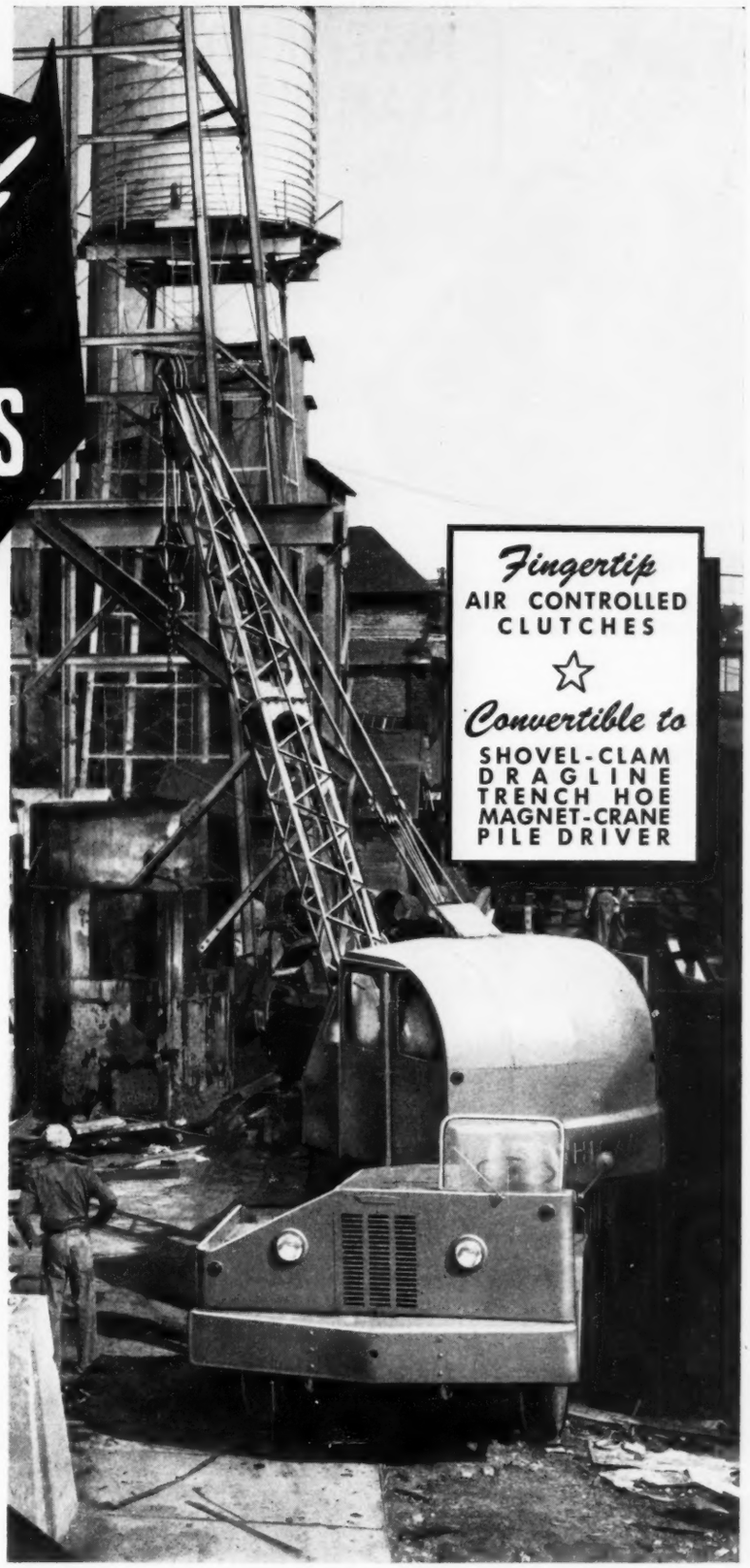
buildings supported by structural steel is increased by warping and buckling of the steel members.

Expanded concrete also has unusual sound deadening properties. In a test made by the National Broadcasting Co., a 4-in. slab of expanded concrete (45 lb. per cut. ft.) was found to have a sound insulation value of 42 decibels at 1,000 cycles, about that of a 7-in. composite gypsum block. Wall partitions made from precast slabs of expanded concrete, because of this sound-deadening ability, are ideal in broadcasting studios, office buildings, and apartment houses.

The innumerable tiny cells in expanded concrete serve not only to impede the transmission of sound, but also to retard the passage of heat. When used for roofs and exterior walls, expanded concrete makes possible substantial savings in air conditioning and fuel costs. Its heat insulating properties are

(Continued on page 160)

fast work IN CLOSE QUARTERS



MICHIGAN Mobile CRANES

ARE "TOPS" FOR JOBS LIKE THIS!

WHEN every minute counts, when limited working space would hamper ordinary equipment, put a MICHIGAN on the job. You'll find that its unexcelled operating speed, handling ease and truck mobility really pays off! And ten to one you'll also find that the job takes less time and costs far less than with other machines or methods.

Make a higher percentage of profit from construction and excavating jobs of all types with fully convertible MICHIGAN Air Controlled Mobile CRANES — available in 6 to 12 ton capacities.

Get The Full Facts
WRITE TODAY FOR BULLETIN CM-36

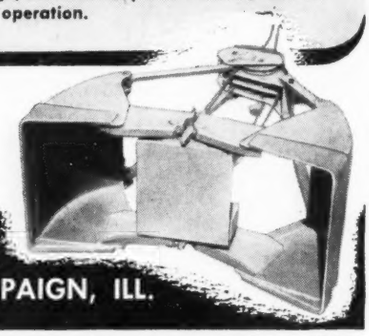
MICHIGAN
POWER SHOVEL COMPANY
BENTON HARBOR MICHIGAN

FIRST TRULY MODERN CLAMSHELL BUCKET •

MODERN ALL-WELDED CONSTRUCTION
Gives smooth working surface and most efficient weight distribution for balance and greater digging efficiency. Stronger and longer-lived because of solid, heavy plate construction.

MODERN DESIGN
Wide, low-sided clams, with wide, solid lower arm brackets provide a capacity load and reduce spillage. Solid base plate in lower sheave block keeps sheaves clean and prolongs life. Hard cutting manganese lip edge actually gets tougher with use.

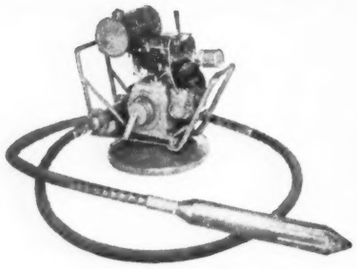
FAST OPERATION
Larger diameter sheaves, with fully sealed needle roller bearings instead of bronze bushings, reduce power loss by friction, deliver full power to cutting edge, combine to provide faster, smoother · operation.



⅜ to 2½ yard sizes. General Purpose, Wide Rehandling and Heavy-Duty Digging Type.

WRITE TODAY FOR FULL INFORMATION.

THE C. S. JOHNSON COMPANY
KOEHRING SUBSIDIARY, CHAMPAIGN, ILL.



Concrete
VIBRATORS
Gasoline Engine or
Electric Motor Driven
CONCRETE GRINDERS

OTHER PRODUCTS
FRONT END SHOVELS
for Industrial Tractors
HEATING KETTLES
for Asphalt and Tar
AGGREGATE DRYERS
for Stone and Sand
ASPHALT PLANTS
Portable — Stationary
Write for Circulars

White Mfg. Co.
ELKHART · INDIANA

Shunk
Superior Quality
BLADES
AND CUTTING EDGES

For any make of machine
Motor Graders, Maintainers, Scrapers, Drags, Bulldozers, Backfillers, Wagon Scrapers, Trail Builders, Trail Blazers, Carryalls. Also—

CUTTING EDGES
WEARING BOOTS
BACK SLOPERS
EXTENSION BLADES
MOLDBOARDS
and
SCARIFIER TEETH

50 years of manufacturing blades has developed for you a special steel, milled through our own rolls and forged at the edges to give that extra wearing quality you need.

All widths lengths, and thicknesses, punched ready to fit your machine.

Consult your internationally recognized Blade Specialists. Write for special bulletins, giving type and name of machines you operate—get set for Blades early.

Shunk Member of A.E.D.
MANUFACTURING COMPANY
Established 1854
BUCYRUS, OHIO,

(Continued from page 158)

compared in Table I (prepared by Aerocrete Corporation of America for Sweets Architectural Catalog) with those of other materials.

Expanded concrete is, of course, impervious to rot, and to attack by vermin and rodents. In lighter weights, made without sand, it may be sawed, nailed and otherwise handled in much the same manner as wood.

Type of Aluminum Powder Important

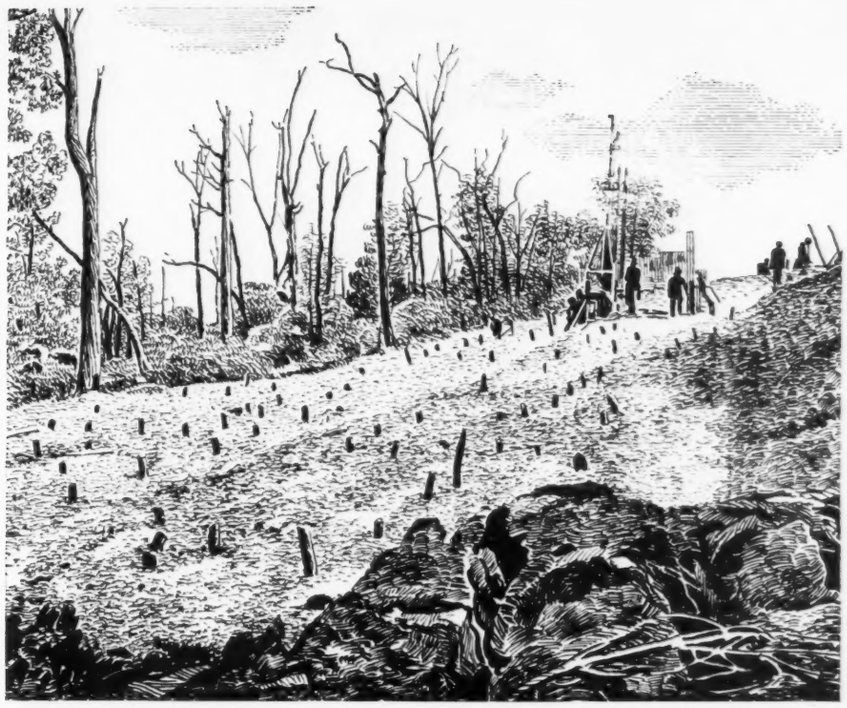
The choice of the proper aluminum powder for making expanded concrete is quite important. Ordinary cement attains its initial rigidity or set in from 1 to 2½ hr. The ideal aluminum powder permits the reaction to be complete at approximately the same time the cement reaches its initial set. If the reaction is too slow, less expansion is attained, since setting of the cement immobilizes the mass. On the other hand if the reaction is too rapid, and reaches completion before the cement sets, maximum expansion cannot be maintained and the mass gradually settles until hardening takes place.

Two types of aluminum powder are available: (1) Flake, made by stamping aluminum, and; (2) atomized, made by spraying molten aluminum. Since the rate of reaction depends upon surface area per unit weight the flake-type powder, which has a much greater surface area, reacts more rapidly than the atomized powder. The amount of powder which should be used in making expanded concrete is about 0.2 per cent, by weight, of dry cement. Decreasing this ratio lowers the maximum attainable expansion. Increasing it speeds the rate but not the final amount of expansion.

Control of Expansion

Rate of expansion is greatly affected by the temperature of the water used in making expanded concrete. In general, satisfactory results can be obtained as long as the temperature is above 70 deg. F. Under field conditions the maintenance of this minimum temperature is often very difficult. To overcome this difficulty and to offset the effect of slight variation in the reactivity of cement obtained from different sources, certain proprietary compounds have been placed on the

(Continued on page 162)



ATLAS ROCKMASTER

Licks Breakage—Back break—Vibration

Check these Features

✓ **NOISE AND CONCUSSION** are drastically cut down

✓ **ROCK BREAKAGE** is decidedly more complete

✓ **SECONDARY BLASTING** is reduced to a minimum

✓ **BACK BREAK** can be greatly reduced—more solid footage is assured

Identify the ROCKMASTER by the Blue Color

What a different story than that of previous blasts when the Atlas Rockmaster System of Blasting was put to work on a shot involving 146 wagon drill holes.

The report of the blast was muffled—vibration was called "negligible" by observers.

There was little throw, and *no* back break—drillers went right to work on the next series of holes.

Breakage was "*100% better than in any previous blast.*"

Yes, reports from east, west, north and south show that this wholly new and revolutionary system of blasting produces results that are literally amazing. And, that's true for well drill shots as well as wagon drill blasts—on construction jobs and in quarries.

Rockmaster can almost surely save time and money for you, too. Let the Atlas representative show you how.

ATLAS EXPLOSIVES

"Everything for Blasting"

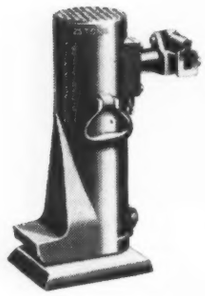
CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

STRONG— TOUGH— DURABLE—

DUFF-NORTON JACKS

and TRENCH BRACES



HEAVY DUTY SCREW JACKS

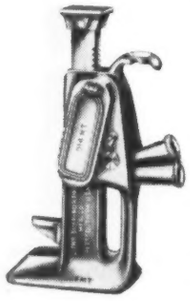
CAPACITIES: 15 TO 50 TONS

Also available in higher capacity types, these rugged, dependable jacks are particularly suitable for rough outdoor use. Equipped with foot-lift for low loads, convenient carrying handles. The 50-ton sizes are designed with large heads.

STEEL TRENCH BRACES

Ideal for trench bracing work, Duff-Norton Trench Braces speed up shoring work and prevent cave-ins. Available as complete units, as illustrated, or as separate fittings, and for attachment to timbers.

AUTOMATIC LOWERING JACKS



CAPACITIES: 5 TO 25 TONS

For all general lifting service, these general purpose jacks are equipped with the Genuine Barrett Automatic Lowering Mechanism.

Handy for all types of work, they are strong, easy to operate, equipped with foot-lift for low loads.

A JACK FOR EVERY JOB

There is a safe, efficient, easy-operating Duff-Norton Jack for every construction job of lifting, lowering, pushing and pulling. Be sure you have a stock of Duff-Norton Jacks on hand. Catalog on request.

THE DUFF-NORTON MANUFACTURING CO.
PITTSBURGH, PA.

Canadian Plant:
COATICOOK, QUE.

There Is A
Distributor Near You

(Continued from page 160)

market. These materials contain, in addition to the proper grade of aluminum powder, chemicals which facilitate uniform aeration of the concrete.

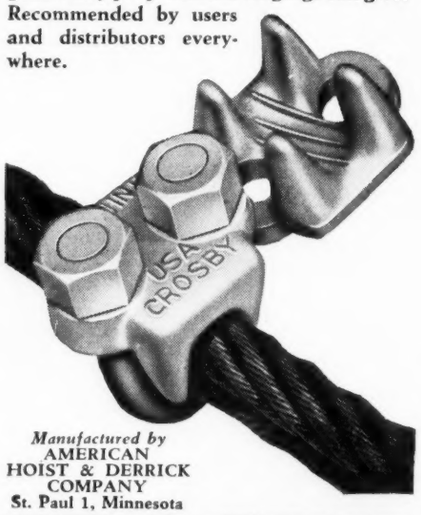
High Water-Cement Ratio

Proper water-cement ratio is extremely important in the production of expanded concrete. It must be greater than that of ordinary concrete, because as usually made, concrete is not sufficiently fluid to permit satisfactory expansion. The water-cement ratio for expanded concrete should be between 6½ to 8½ gal. per sack as compared with 5 gal. per sack for ordinary concrete. This quantity of water will result in a rather "soupy" mix which is necessary if maximum expansion is to be obtained.

It is possible to alter the weight per cubic foot of expanded concrete by varying the water-cement and the sand-cement ratios. However, it may also be necessary to vary the aluminum-cement ratio slightly, especially in the production of heavier weights of expanded concrete. The heavier material, containing larger proportions of sand or

FORGED!

The bases of Crosby Clips have the extra strength and shock-proof ability that only generously proportioned forgings can give. Recommended by users and distributors everywhere.



Manufactured by
AMERICAN
HOIST & DERRICK
COMPANY
St. Paul 1, Minnesota

CROSBY CLIPS

other aggregate, requires additional quantities of aluminum powder to compensate for its greater weight.

Because most light aggregates are more absorbent than sand, the amount of water used with them in making expanded concrete is greater —about 9 to 10 gal. per sack of cement as against 6½ to 8½ gal. for expanded concrete made with sand.

Formulas for Expanded Concrete

A general formula which may be varied within the limits indicated to produce a material weighing from 40 lb. to 80 lb. per cu. ft. is given in Table II. Also included in Table II is a formula for a small experimental batch of expanded concrete. If the patented aerator compound is used in place of aluminum powder, the recommended quantity is 6 to 9 oz. per sack of cement.

The dry ingredients should be mixed for from 1 to 3 min., after which water should be added and the mixing continued for an additional 1 to 3 min. The concrete then is ready to be poured into the forms. After pouring, the mixture should not be disturbed.

Expanded concrete may be field cast in place or used in the form of precast slabs. Of the two methods, field casting is better for floors and roofs. On big jobs, where specifications are rigid, it is advisable to have technical supervision of the casting. When pouring a cellar floor in a small home, a barn floor, or similar jobs, good results can be obtained without working to exact specifications.

Precast Slabs

Precast expanded concrete slabs are recommended for vertical partitions. In reasonable sizes precast slabs can be made in a factory and transported to the job. Casting of small blocks or bricks is not recommended. Friction between the walls of the form and the expanding concrete produces distortion—a difficulty not encountered with large casts. Small blocks or bricks can be made by sawing large slabs before they are completely cured.

Some experiments have been conducted by Aerocrete Western Corporation to determine the effect of substituting light aggregates for sand in making expanded concrete. Interesting results have been obtained with such products, with expanded mica particularly. Extreme lightness and satisfactory strength, desirable properties in a building material, are achieved.

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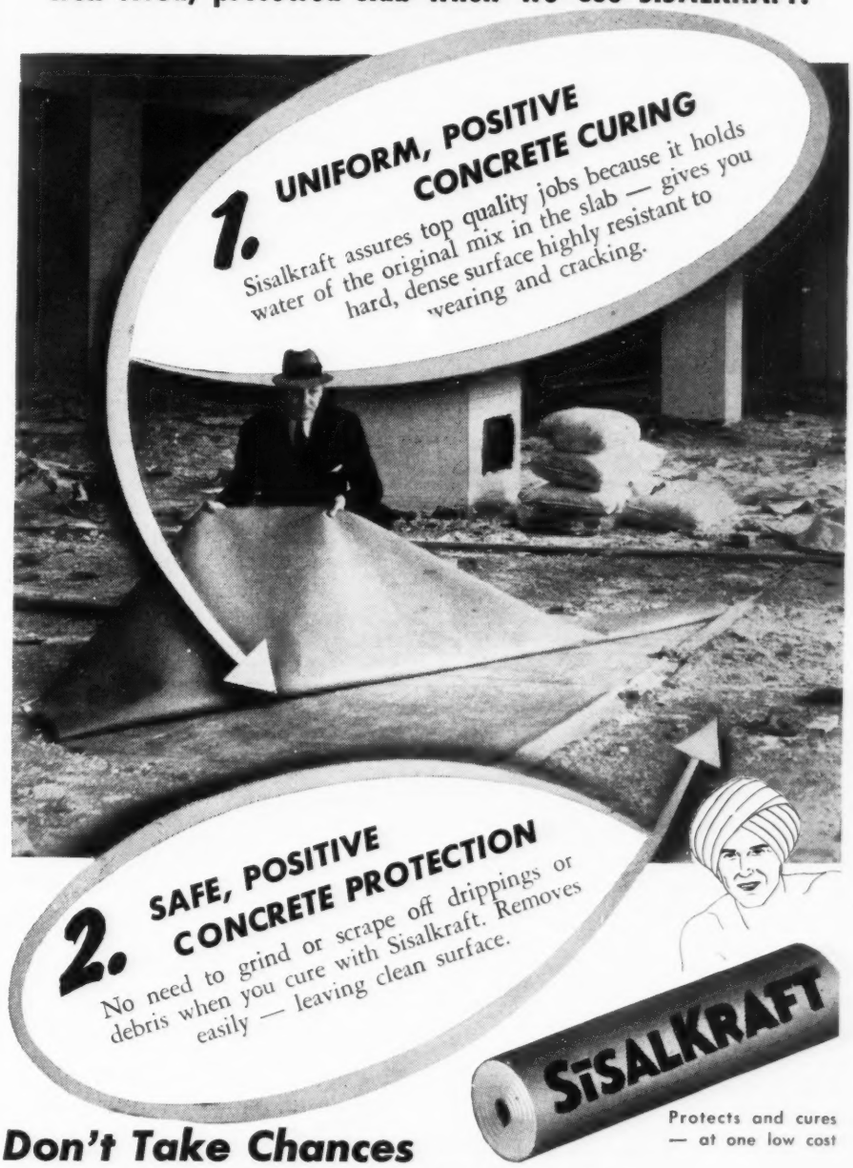
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Tilt-Up Method

(Continued from page 109)

door openings is the bulkhead around the outside edge of the panel which is easily adjusted to the required size.

The procedure consisted of first constructing the foundation wall and footings in the usual manner. The reinforced concrete floor slab was then placed on the ground and the surface was floated and troweled to the final finish.

The next step was the casting of the wall panels. Each panel was cast adjacent to its final place in the wall so it only had to be tilted up into a vertical position. A thin layer of sand covered with 10-lb. building felt was spread on the floor slab to protect the floor and to prevent any bond between the floor and the wall panels. A form or bulkhead just the height of the wall thickness and of the outside dimensions of a panel was set up on the floor. The side forms and window opening forms served as screed strips for striking off the concrete. Four sets of forms were provided to build 12 wall panels. The wall reinforcing steel was put in position and supported on chairs on the floor slab. The horizontal bars were allowed to project through the side forms 6 in. to act as dowels into the columns between panels when the panels were tilted up into position.

Concrete Placement

Concrete designed to have a 28-day strength of not less than 3,000 lb. per sq. in. was used. The concrete was placed just as it would be placed in a floor slab and the top surface which ultimately became the outside of the building was finished by floating and troweling.

The panels were wet cured for 5 days and were then prepared for erection by attaching the lifting rig to bolts which had been set in the concrete. These lifting bolts were wrapped with paper, as shown in an accompanying detail, to facilitate unscrewing them from the embedded nuts. The lifting rig consisted of two I-beams just a little shorter than the height of the panels. These I-beams were fastened to the panel at two points above the window opening and at one point just below the opening and were tightly

(Continued on page 166)

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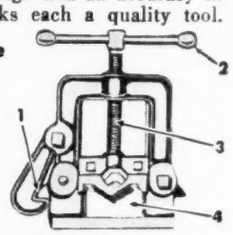

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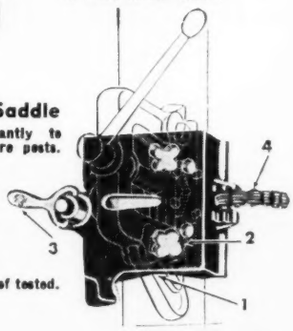

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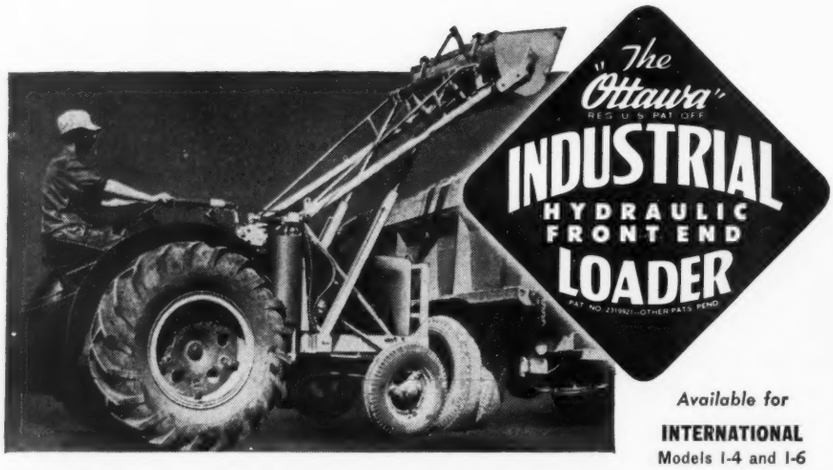

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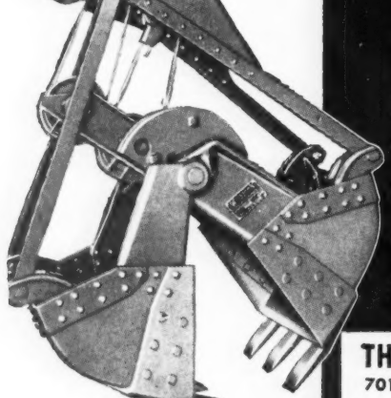

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(Continued from page 164)

wedged against the concrete at the bottom edge. An I-beam yoke was attached to the two long I-beams by hinged connections so the yoke could rotate as the panel assumed a vertical position when hoisted by a crane attached to the yoke. By this arrangement, the relatively narrow strips of concrete along the window jambs were relieved of any erection stresses other than those due to their own weight. There was no bending in these jamb strips due to the whole weight of the panel because the load was all taken by the I-beams.

It was found that no bumper was necessary to keep the panels from sliding off the foundation while raising them into a vertical position. The friction of the bottom edge of the panels with the floor slab was generally sufficient but where there was any tendency to slide it could be prevented easily with a snubbing rope.

Along the top of each panel a beveled 2x4 was anchored to the concrete when the panels were cast. This 2x4 strip served a double purpose. During erection and until the columns between panels were placed bracing timbers which can be seen in the construction view were secured to the wood strip and later it served as a cant strip for the roofing and the metal roofing stop is attached to it.

Power Equipment Used

A self-propelled crane was used to tilt the panels into a vertical position. *Thirty* minutes were required to lift a panel, secure the bracing and wedge it at the bottom.

When the panels were in position the projecting ends of the horizontal bars were wrapped with paper, the column bars were placed and the column forms, which were already built, were set up for the cast-in-place columns closing the space between the wall panels. The panels were held on wedges until the joint at the top of the foundation wall was packed with stiff consistency portland cement mortar. It is not contemplated that any sealing of the vertical joints between the wall panels and columns will be needed but if the need should arise the apex of the V-joints can be filled with calking compound.

With the completion of the walls the building was ready for the roof, interior partition work and finishing. Concrete masonry was used for the back wall to permit easy removal

for a contemplated extension when needed.

By using the tilt-up method of concrete construction an estimated saving of $2,000 or about 30 c. per sq. ft. of floor area was made as compared with usual construction. A minimum amount of form lumber was required.

Bridge Bearings Sealed

(Continued from page 88)

only lead to confusion, so that the discussion will be continued along the simpler lines of general causes, effects and cures.

All bearings of the truss spans were established on bed plates set upon adjusting shims and wedges. When the structure was brought into proper position for dead loads the area between bed plate and pier was rammed full of rust joint material consisting of iron filings, flowers of sulphur, sal ammoniac and water enough to make it workable. A rebate, of 1½ in. all around the edge of the plate, was then calked tight with lead wool. Thickness of rust joint varied from 1 to 2 in.

All roller and segmented roller nests were packed solid with Albany grease between the bed plate and the superstructure sole plate. Grease was retained by steel plate boxes that also included the four anchor bolts. These boxes were set on sheet lead gaskets and secured to the bed plate by means of a row of cap screws, all around the outside, flanged bottom edge. Anchor bolts extended up through long, slotted holes in the upper plates because they had to serve as hold-downs during erection, and they extended down for 4 ft., in pipe sleeves, to anchor plates embedded in the concrete.

The down-spout action of the truss members concentrated water on the bearings where it found its way through the slotted holes into the mass of grease. Here, due to the pumping action of the moving rollers or by saponification, or both, the water became mixed pretty thoroughly with the grease and found its way down along the an-

(Continued on page 168)

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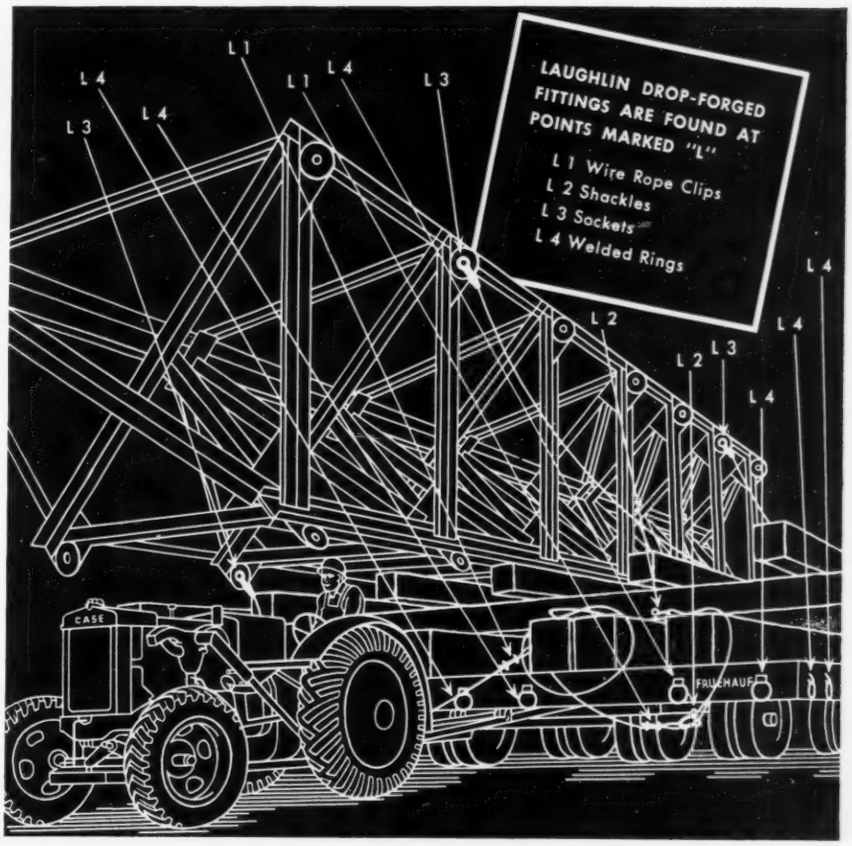

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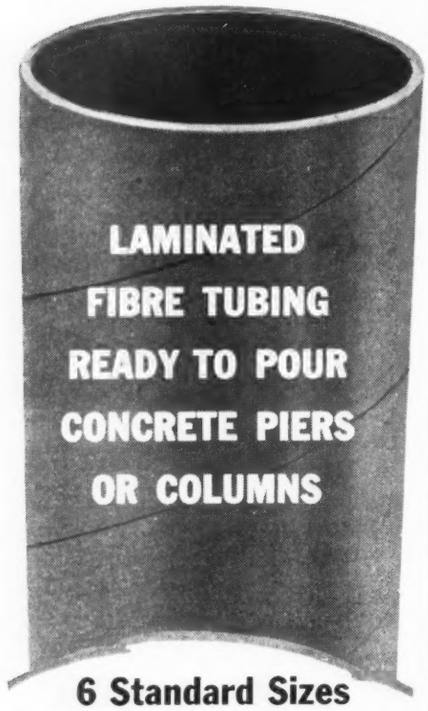

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(Continued from page 167)

chor bolts and sleeves to saturate and freeze the concrete in the pier tops. There was no filling in the sleeves but even had there been grout, shrinkage of it would, undoubtedly, have provided a disastrous avenue for the water.

Weather Affects Bearings

Lake Champlain is in cold country. At some time the north anchor span expansion bearings that take the movement of 724 ft. of continuous structure, froze up and the superstructure plate skidded forward over the rollers. Upon thawing out in the spring the rollers were again free to rotate and evidently functioned properly in warm weather. This, or some similar cycle, was probably repeated over the years. In any case, when the grease boxes were removed from these bearings it was found that the entire nests had been displaced to the rear approximately 6 in. beyond their proper position with regard to the center of the main pin. Some 10 gal. of free water gushed out to greet the astonished work-

(Continued on page 170)

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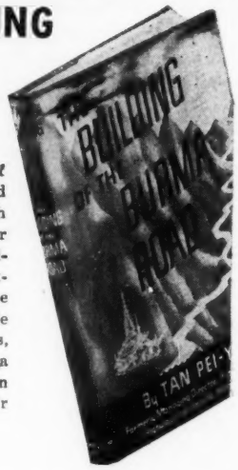

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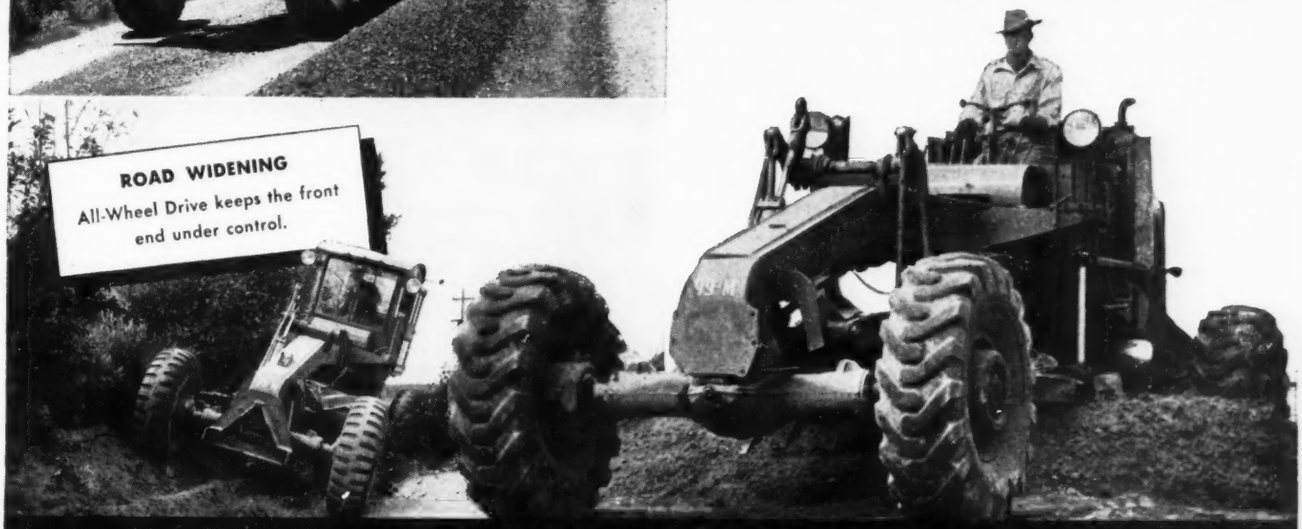

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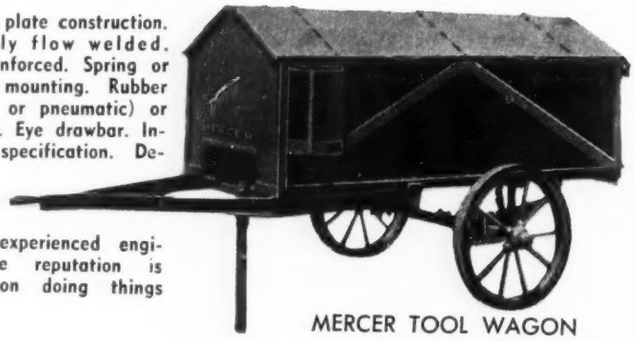

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(Continued from page 168)

men when the first plate was removed from the grease box.

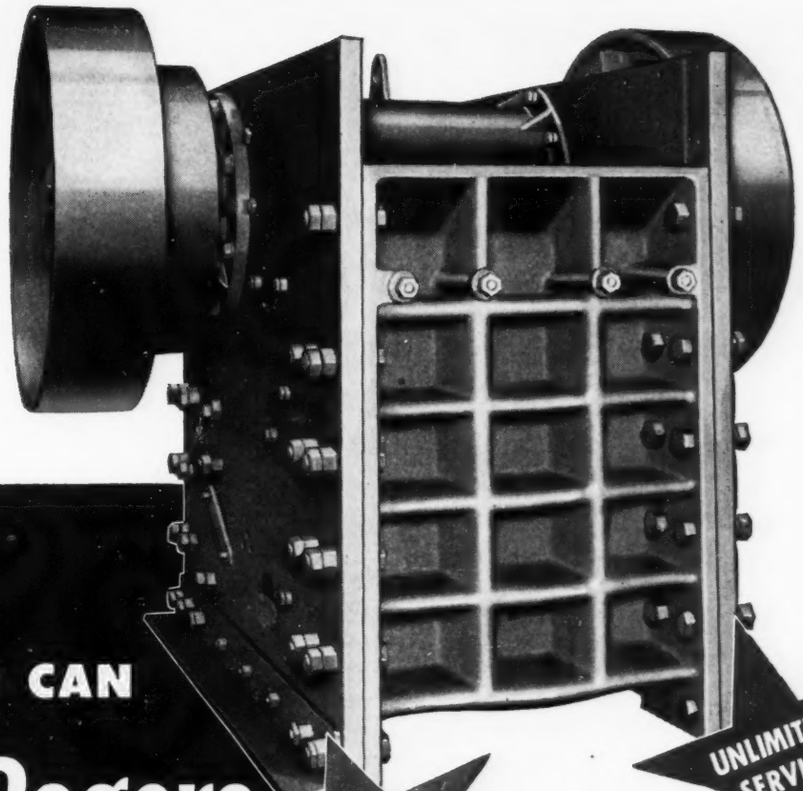
That episode recurred at all other moving bearings, with varying quantities of water proving the logic of the remedies that had been proposed. As a result of the lifting action of the expanding mass of frozen grease and water, many of the anchor bolts had seized upon the top surface of the upper plates and the subsequent movement of the bridge had bent them way out of plumb, some forward, some backward. A few had been broken and replaced with threaded pipe sleeve nuts.

Corrective Measures

The following corrective measures were agreed upon: Remove all grease boxes and leave them off. Remove all grease from the rollers, rockers and details. Clean nests and plates and apply rust inhibitor grease to all exposed surfaces by wiping coats or diluted spray. Drill soup holes through the bed plates adjacent to the anchor bolts so that the pipe sleeves could be blown out and filled with grout up to within 4 in. of the bridge seat. Inject calking compound into the top 4 in. of the sleeves and the soup holes. Weld a plug into the soup holes. Weld a split washer to the anchor bolt and base plate to seal that point. Check and replace rust joint compound with mortar, where necessary. Check and replace lead wool calking around base plate. Apply calking compound fillet all around base plates at bridge seat level. Apply asphalt roof paint to top surface of all piers. Remove spalled concrete from the pier faces, patch and restore surfaces. These sealing methods were to be applied to every bearing, fixed and expansion, in the entire structure.

The problem of finding an experienced crew to undertake repairs of this nature, in war time, proved to be serious and for a time looked hopeless. Fortunately, a member of the Commission, from Port Henry, recalled that the proprietor of a local garage having welding and machine shop equipment, had acquired a reputation for unusual ability in his line, and he was subsequently engaged for the work. The writer is proud to present, in Fig. 4, "Ollie" Currier and his helper, Lester Moore, who, forsak-

(Continued on page 172)



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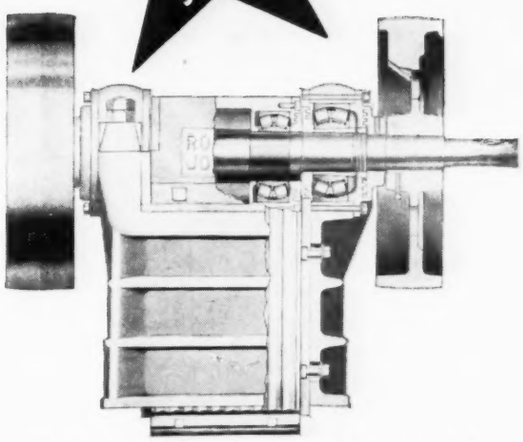

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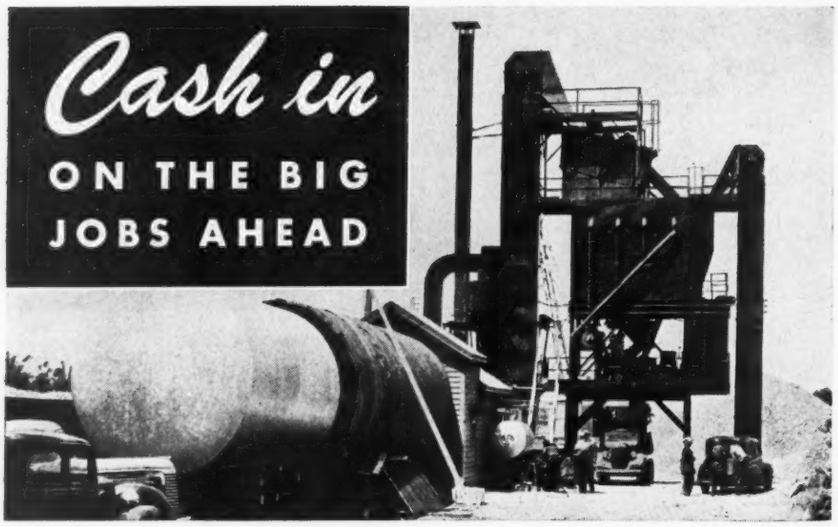

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(Continued from page 170)

ing grease rack and socket wrench for the better part of two summers, took up the challenge and carried out the work on the bridge. They made quite a team, these two typical, resourceful, unassuming mechanics, who with thousands of their kind, devote their lives to keeping the nation's wheels a-turning.

Old Grease Removed

One of the most difficult problems proved to be the complete removal of the old grease. Various methods were debated, including that of converting the grease boxes into hot water baths by injecting live steam, and boiling off the grease through an overflow pipe. It developed that, after removing all possible grease by pushing and scraping, the residue dried out after a winter's exposure to the air and it could be cleaned off by mechanical means and compressed air.

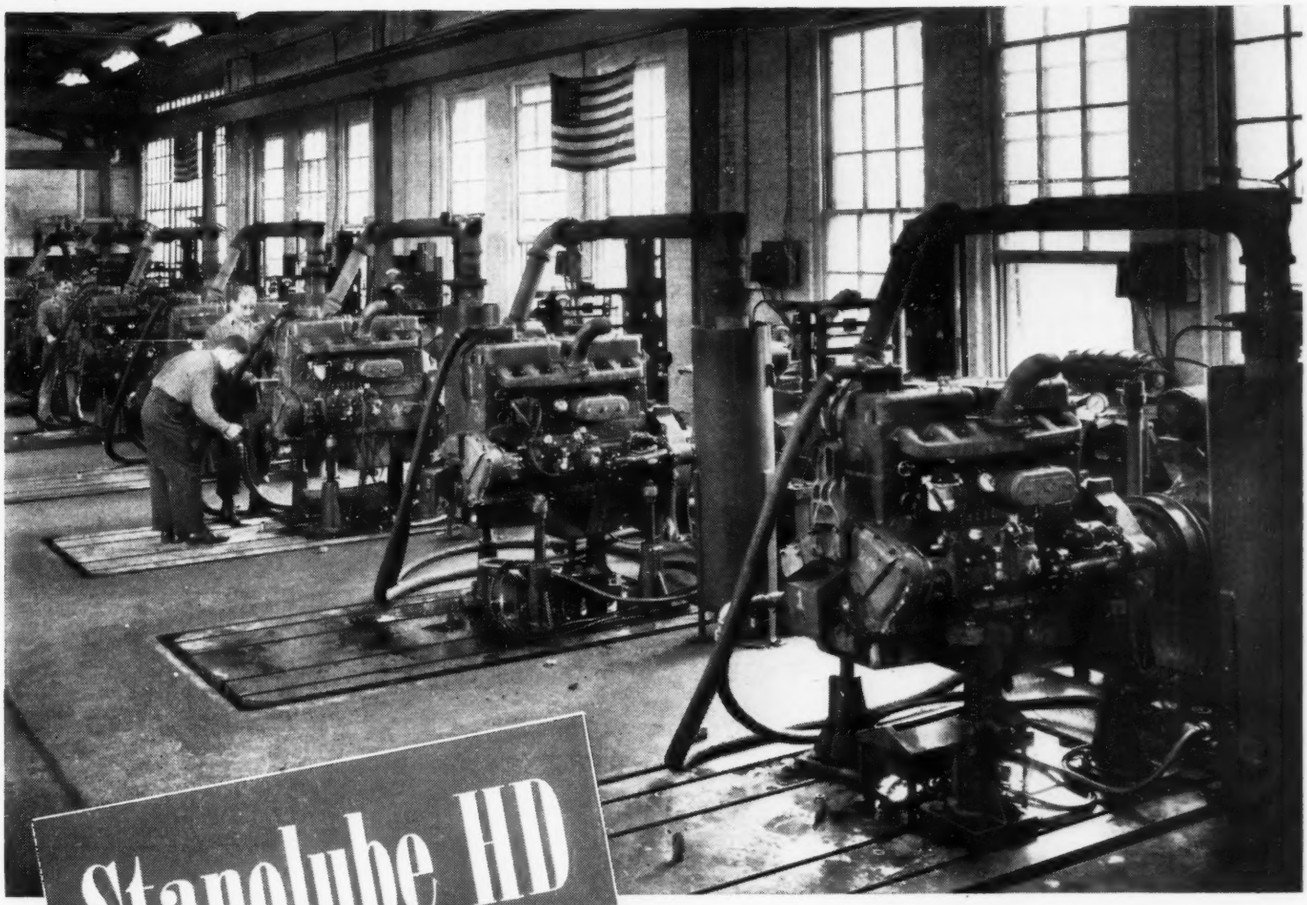
It was found that the roller nests were guided by means of side bars, riveted to the base plates at the ends of the nests, instead of at the center, as were the segmented rollers. These bars would have to be elevated to permit the escape of rain water, ponded between the rollers. This was done by burning off the rivet heads, removing the guide plate, burning the shanks off flush and welding on square filler blocks over the rivet stubs, then welding the guide bar on to the blocks, creating scuppers through which the water could escape from between the rollers. All new welds were generously coated with the rust inhibitor grease.

The grease box cap screws were run back into their tapped holes on top of a generous squirt of calking compound to seal the holes against possible leaks through the base plate. All anchor bolts that protruded through the upper plate of the bearings were straightened, their nuts tack-welded to the round washers and the nut turned back on to leave ¼ in. free space between washer and plate to obviate binding.

Re-Positioning Roller Nests

An interesting trick was tried at the north anchor span bearings to force back into position the displaced roller nests previously men-

(Continued on page 174)



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Here's the story of a heavy duty gasoline engine and Diesel oil that was adopted for break-in service by a Diesel engine manufacturer. Its ability to resist heat, prevent scoring and eliminate engine deposits on the tough break-in job described at the right is a clear indication of how Stanolube HD will reduce maintenance trouble and expense in any truck or stationary gasoline or Diesel engine service.

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Eight 165 HP Diesels are run-in at one time on the test line pictured above. Before using Stanolube HD, the practice was to tear down each engine to inspect bearings and pistons at the end of the break-in period. Since adopting Stanolube HD, engine parts are so uniformly clean and free from scuffing that only one out of every 25 engines is disassembled for inspection.

A 1500 gallon oil circulating system supplies Stanolube HD to the engines for two hours of the break-in run. For the balance of the period, the engines are lubricated through the normal engine lubricating system. All oil is returned to the circulating system at the end of the run. Make-up oil is unusually low and one fill of oil has operated two years. A 150 gallon filter system removes contaminants from the oil.

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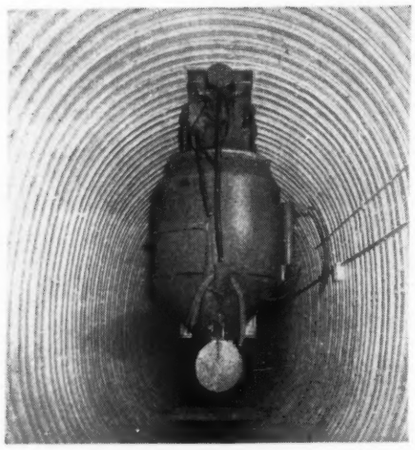

Rear view of weighing hopper. This elliptical batching tunnel of No. 10 gage Armco Steel is 11 by 13 feet and 460 feet long. Raw aggregates were stored over a 10-foot tunnel, 260 feet long, and wet sand over an 8-foot tunnel, 190 feet long.

This is how three aggregate tunnels built of ARMCO Corrugated Liner Plates helped speed construction of the Norfork Dam—a 1,500,000 cubic yard job.

First, the plates were easy to handle and install. Then, their designed strength permitted placing the tunnel directly beneath the aggregate pile, which attained a height of 60 feet. Delays caused by freezing in cold weather were avoided because the aggregate was handled from the bottom.

Armco's method of bolted construction made it a simple matter to locate the hoppers at any desired point. When the job was done the ARMCO Liner Plates were removed, nested together and stored in a minimum of space for future use.

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ARMCO

ARMCO

Tunnel Liner Plates

(Continued from page 172)

tioned. A stirrup was rigged, at quitting time, to hold the nest and front edge of the top plate in fixity so that night-temperature contraction would drag the nest along with the superstructure. In the morning the stirrup was dropped, and milled, concave wedges were driven in between rear roller and base plate so that daytime-expansion would skid the top plate over the nest, to the rear. This cycle was repeated for three days when about 1½ in. had been gained in restoring the nest to proper position. The roller side bar studs began to shear off so the method had to be abandoned. Hydraulic jacks were then obtained, the span raised slightly, and the nest jockeyed into correct position. The broken studs were removed and replaced. Fortunately, jacking beams had been provided here for dead load adjustment in the fabrication of the steel.

Fixed Bearings

Conditions on the fixed bearings were similar to those on the expansion bearings. Multi-celled, steel castings separated the top and bottom bearing plates, with the anchor bolts extending through the casting as shown in the illustration. Exploratory holes were burned through the bottom edge of one of these castings, revealing that the cell entered was full of water. Holes were then burned all around the castings to let the water escape. Larger working holes were burned out of the side walls, opposite the anchor bolts, to permit the same grouting and sealing operations to be performed as had been carried out on the expansion bearings. Anchor bolts were then sealed by welding on split washers and the soup holes sealed with plugs. All burned-out sections were welded back into the casting walls.

After allowing time for the water to drain out of the cellular block, a bead weld was run all around the top edge, sealing it to the top plate. A flat strap was then welded all around the base of the casting to cover and seal its bottom edge, including the drain holes. The anchor bolt nuts and washers were run down into a blob of calying compound to seal that point.

Some of the bearings on the smaller piers rested upon two base plates and in these instances, the exposed edges were sealed with a continuous bead weld all around. Similar procedures, involving weld-

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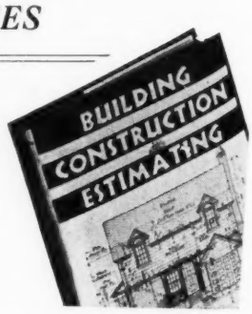

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ing and calking, were employed, with variations, to seal off every possible point of entry of water, into or beyond the bearing details.

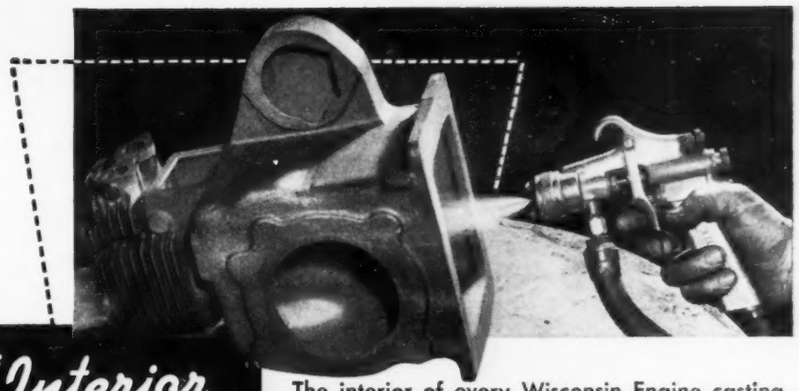
Near the end of the summer of 1944, steel ladders were constructed in the Currier shop and replaced on all the water piers to facilitate the work and to encourage more inspections of the structure. In recognition of the temptation before boatmen to use the ladders to tie-up to, the lower ends were kept some 12 ft. above lake level. A substantial approach ladder was made from a 16-ft. apple-picker's ladder to which a stand-off base platform could be readily attached. Later, Mr. Thomas had a light scaling ladder made that could be handled easily by one man from a rowboat for use in inspection trips. Once the ladders were in place, it was no longer necessary to use the cumbersome float that had been used the first summer.

Job Progress

The work is not yet completed at this writing, but the sealing of all anchor bolt holes has been accomplished. These piers are high and exposed to the weather and this fact has been responsible for an interrupted schedule of operations through the summers of 1944 and 1945. It is expected that the remedial work will be completed early next summer, substantially as planned, with the result that the ingress of water into the pier top concrete will be completely and permanently stopped. The asphalt paint did not adhere too well to the pier caps due to their having become impregnated with grease during operations and by leaching from that which was ever escaping from the grease boxes. This detail may be abandoned.

The restoration of the concrete surfaces of the piers should present little difficulty. With the war over, it is expected that this phase of the work can be undertaken this year by an experienced contractor, fully equipped to do it.

It is hoped that this discussion will emphasize the vital importance of establishing a positive and permanent water seal at every bridge seat. It is not difficult to do at the time the structure is built. It may be extremely difficult of accomplishment later on. Ultimate failure of the structure may be seriously threatened if this detail is neglected. Water, the bane and basis of engineering, loves to consort with anchor bolt holes.



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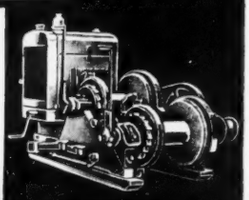

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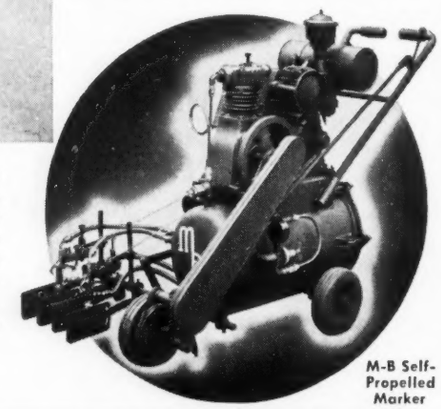

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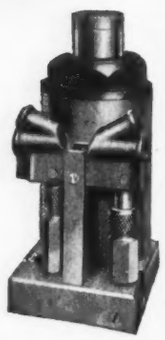

Simplex 50HJ Hydraulic Jack, capacity 50 tons, hydraulic lift 7". No. 30HJ, same design, capacity 30 tons. Also 3, 5, 8, 12 and 20-ton Hydraulic Jacks.

New standards for the easy and speedy lifting of heavy loads have been established by Simplex 30 and 50-ton Hydraulic Jacks. Each of these units has two pumps—high and low speed—which can be operated singly or in unison, providing smooth and ample power for every lifting job.

Simplex Hydraulic Jacks are ruggedly constructed throughout. The base is of special analysis solid steel plate stock. Stability is assured by the well-balanced pyramid design. Other features include: non-deteriorating pressure seals, shielded release valves, double lever socket for convenient operation in close quarters, and an overload safety factor of 50%.

Sold by leading supply houses everywhere.

Templeton, Kenly & Co.
Chicago 44, Ill.

SIMPLEX
WORLD'S MOST COMPLETE LINE OF
JACKS
LEVER
SCREW
HYDRAULIC

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Worthington-Ransome Blue Brute Distributors

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Ala., Montgomery, Burford-Toothaker Tractor Co.
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Vt., Barre, A. M. Flanders, Inc.
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Mo., Kansas City, Brown-Strauss Corp.
Neb., Lincoln, Highway Equip. & Supply Co.
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O., Cleveland, H. B. Fuller Equip. Company
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Mass., Cambridge, Field Mach. Company
Mich., Detroit, W. H. Anderson Co., Inc.
Flint, Gransden-Hall & Company
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No. Bergen, American Air Compressor Corp.
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N. Y., Buffalo, Dow & Co., Inc.
New York, Air Compressor Rental & Sales
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Buy Blue Brutes

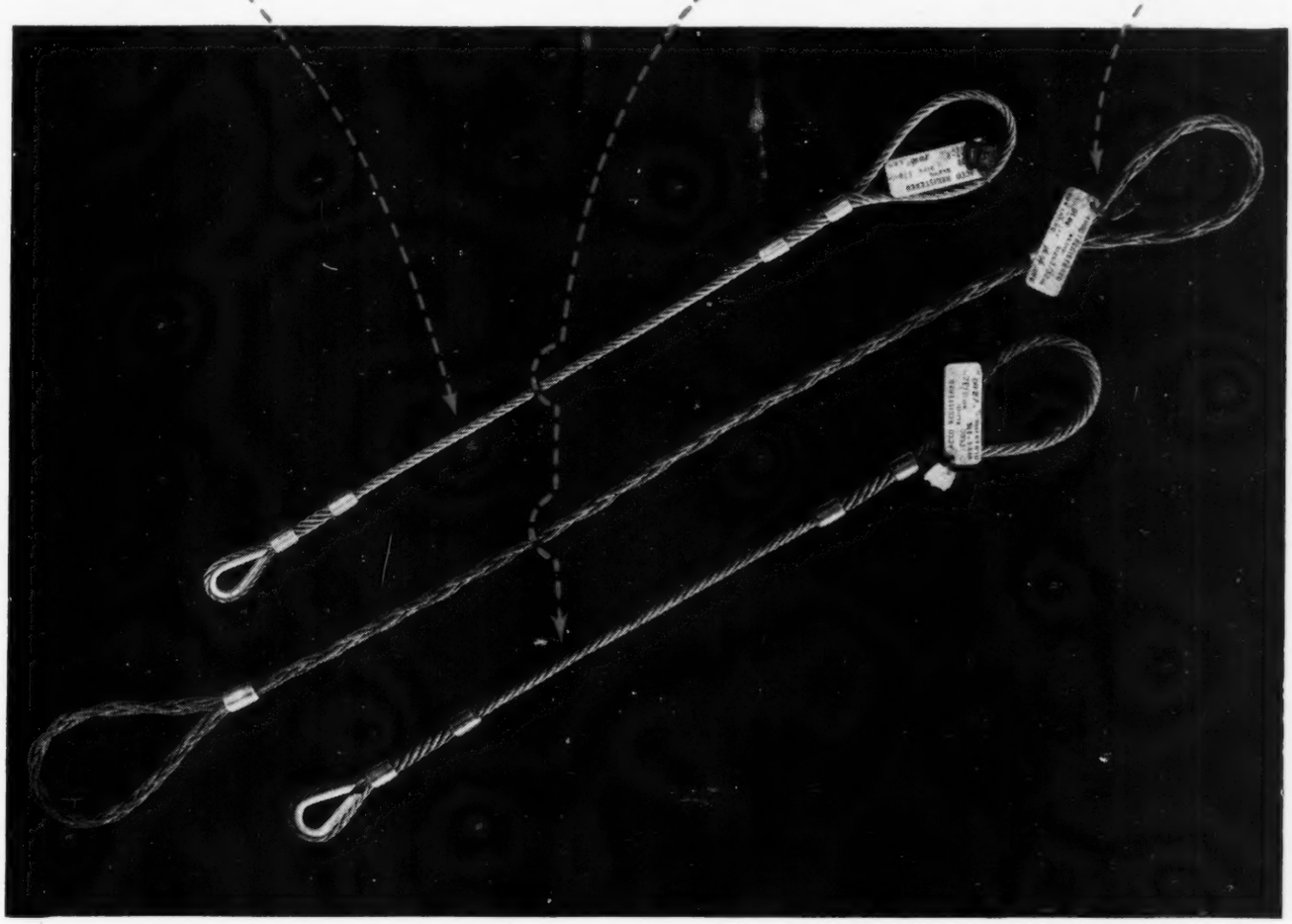
Worthington Pump and Machinery Corp.

Worthington-Ransome Construction Equipment Division

Holyoke, Massachusetts

WHICH SLING?

Strand-Laid? Cable-Laid? Braided?



American Cable has a wider range of sling types than any other manufacturer. Here you can get the exact type of sling best suited to your job. Whether the conventional strand-laid sling, the cable-laid sling, or braided slings made up in 4, 6 and 8 parts, American Cable engineers hold no brief except for the one that will do your job best. And in wire rope endings, too, American Cable takes the lead with the new, 100% efficient ACCO-LOC Safety Splice and the swaged U-LOC. More than this, you may have your American Cable slings proof-tested and registered for known strength and safety. Here again is another sling service that is exclusive with American Chain & Cable. You cannot buy a better sling than an ACCO-Registered sling — made of TRU-LAY Preformed Wire Rope of Improved Plow Steel.

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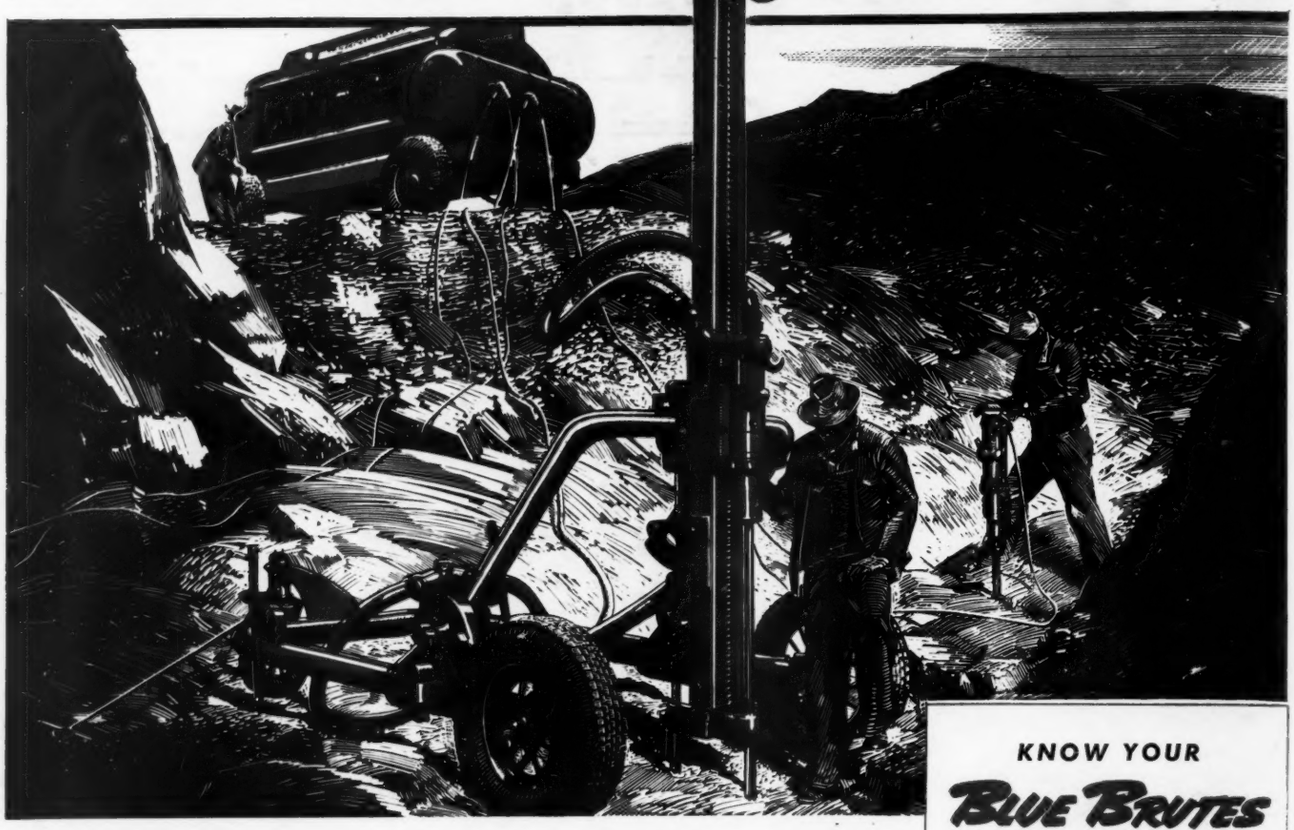
AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

IT'S A STUBBORN BRUTE AND THAT'S GOOD!



You can give this Blue Brute 315′ Compressor the toughest jobs on your books and it won't cry for help until you've got your money out of it many times over.

Take, for example, the three-point suspension of engine and compressor in a single housing — it's a Worthington feature that maintains alignment regardless of shock and vibration. Take the Worthington Feather* Valve — it will stay tight-seating and quiet for a lifetime. Take the full force feed lubrication of engine and compressor — it keeps all moving parts in constantly healthy condition. Investigate those vital features!

Teamed up with those versatile Worthington Wagon Drills (that make holes in any direction and at any angle) or other Blue Brute Air Tools, your Blue Brute Compressor will supply *more air* per gallon of fuel — and will stay trouble-free no matter how tough the going.

Make a date with your near-by Worthington distributor so that he can give you the rest of the facts that prove *there's more worth in Worthington.*

*Reg. U. S. Pat. Off.

H6-4

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Your Blue Brute Distributor will gladly show you how Worthington-Ransome Blue Brute construction equipment will put your planning on a profitable basis. His name is listed on page 180. Blue Brutes include:

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Pavers, Concrete Spreaders and Finishers*, Portable and Stationary Mixers, Pneumatic Placing Equipment, Truck Mixers, Plasfer and Bituminous Mixers and accessories.

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Gasoline and Diesel driven Portable Compressors, Rock Drills, Air Tools, Contractors' Pumps* and accessories.

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Get more **WORTH** *from air with* **WORTHINGTON**

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Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs. Rock Drills and Air Tools that have always set the pace for easy operation — available in a wide range of weights and sizes.

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